Libra
v.5
56
2b

SECOND SERIES VOL. VI, No. 1

BULLETIN

OF

THE NEW YORK ACADEMY OF MEDICINE

JANUARY, 1930

INCORPORATED 1851

PUBLISHED MONTHLY BY
THE NEW YORK ACADEMY OF MEDICINE
Fifth Avenue and 103rd Street
NEW YORK, N. Y.

SECOND SERIES VOL. VI. No. 1

BULLETIN

OF

THE NEW YORK

ACADEMY OF MEDICINE

JANUARY, 1930

INCORPORATED 1851

PUBLISHED MONTHLY BY
THE NEW YORK ACADEMY OF MEDICINE
Fifth Avenue and 103rd Street
NEW YORK, N. Y.

Entered as second-class matter, February 3, 1928, at the postoffice at New York, N. Y., under the Act of August 24, 1912.

Subscription $2.00 per year. Single copies, 25 cents.

CONTENTS

ANNUAL GRADUATE FORTNIGHT. FUNCTIONAL AND NERVOUS PROBLEMS IN MEDICINE AND SURGERY, October 7 to 19, 1929 1

Neuroses Following Accident, FOSTER KENNEDY 1

The Surgical Indications for Sympathetic Ganglionectomy and Trunk Resection in the Treatment of Diseases Resulting from Vasomotor Spasm of Peripheral Arteries, ALFRED W. ADSON 17

The Endocrines and the Vegetative Nervous System, WALTER TIMME 33

Legal Status of Hospital Records 49

Library Notes:

Recent Accessions 51

Among our Manuscripts, GERTRUDE L. ANNAN 56

Proceedings of Academy Meetings 59

Elections to Fellowships 64

A Bequest Declined 65

Deaths of Fellows of the Academy 66

OFFICERS AND STAFF OF THE ACADEMY

1930

President

JOHN A. HARTWELL

Vice-Presidents

JOHN E. JENNINGS
EDWIN BEER
LEWIS A. CONNER

Recording Secretary

FENWICK BEEKMAN

Treasurer

SETH M. MILLIKEN

Trustees

EUGENE H. POOL
BERNARD SACHS
CHARLES L. DANA
SAMUEL A. BROWN
ARTHUR B. DUEL
WALTER L. NILES
SAMUEL W. LAMBERT
JAMES ALEX. MILLER
JAMES F. MCKERNON
GEORGE D. STEWART

Council

The President
The Vice-Presidents
The Trustees
The Treasurer
The Recording Secretary
The Chairmen of
Standing Committees

Director

LINSLY R. WILLIAMS

Assistant Secretary

FREDERICK P. REYNOLDS

Assistant Treasurer

RODERICK V. GRACE

Librarian

ARCHIBALD MALLOCH

Consulting Librarian

FIELDING H. GARRISON

Executive Secretary
Public Health Relations Committee

E. H. L. CORWIN

Legal Counsel

FRANK L. POLK, ESQ.

BULLETIN OF
THE NEW YORK
ACADEMY OF MEDICINE

VOL. VI. JANUARY, 1930 No. 1

ANNUAL GRADUATE FORTNIGHT

Functional and Nervous Problems in Medicine and Surgery October 7 to 19, 1929

NEUROSES FOLLOWING ACCIDENT *

FOSTER KENNEDY,
Professor of Neurology, Cornell University Medical College

Lately the chairman of the New York State Society of Industrial Medicine stated that 26 per cent of all hospital admissions in the United States in 1927 were cases for compensation adjustment. The compensation law has existed since 1914. It has already produced a change and a complication of part of our medical problems. You may have noted that the title of this address is not that in common use, namely, traumatic neuroses. "Neuroses following accident" has been chosen instead to avoid prejudging the causative factor of the nervous condition under review. The juxtaposition of noun and adjective leads to the easy assumption that neurosis following injury is necessarily caused by that injury.

At the outset, we must recognize that it may be only initially related to the injury or accident. The real origin may be fear produced by wrong medical diagnosis—or avarice, from hope of increment, played upon by legal counsel, relatives and friends. It is not difficult to adjust compensation in most general surgical injuries due to accident. The disability and apprehension produced by the

* Delivered October 9, 1929.

ACB
8-4-36

loss of a limb or an eye require no very expert appraisal. Legal adjustment of nervous ills, however, may be puzzling and vexatious. However, individual decisions must be individually arrived at and to insure justice it is important, if possible to ascertain the condition of the injured person before the accident.

In the millions of nerve cells in the gray matter of the brain and cord with their enormous aggregation of processes there exists the complicated mechanism in which are represented our highest mental function and the main spring of physical action. In what manner, mental processes and emotional states are evolved from or through nervous structure is as yet hidden from us. Our ignorance becomes the more plain in those nervous disorders known as "functional," the symptoms of which are subjective. There is evidence, however, and overwhelming evidence, that structural nerve changes underlie subjective clinical manifestations. There must be organic change causing or paralleling our psychic phenomena. But what these may be, the finer stains of gold and silver and the most careful chemical analysis have as yet failed to disclose. They must be empirically known by their symptoms and not by their basic conditions.

Many suits for damage following accident are based upon occurrences of purely functional nervous affections.

To quote Sir John Collie: "It is unfortunately the experience of most physicians that nervous people, who are given to self-examination, unconsciously foster subjective sensations which their stronger and better balanced neighbors would ignore. The idea of illness or a possible injury and its consequences obsesses them. Their pains are real, but often psychic. Such people are victimized by their unstable nervous system. Too often they make no stand against morbid introspection. Frequent gossips with others who have found themselves in similar circumstances, continual rehearsals of the illness or the accident, and the oft-repeated recital of sensations, all act as co-operating factors in bringing about a condition of auto-

suggestion, in the diagnosis and treatment of which the medical profession is lamentably backward."

When a man after severe shock or fright, which has produced no serious physical injury, complains of many subjective sensations it is not easy to believe, and often hard of proof, that the sufferer is not often an impostor, who is pretending disease and exaggerating trifles for gain. Often, however, the symptoms, though indefinite and difficult to prove and to some extent beyond the man's control do not *necessarily* disappear after the suit has been ended; when motives for deceit no longer exist. We must remember that we are one and all suggestible—that seven-tenths of our opinions are accepted by us from other people. We would go to the stake for the belief that the moon draws the tides, but no one has proven it. We would fight doughtily on behalf of classical education because we have been exposed to such. We accept masses of opinion for fact as long as the opinions are consonant with our emotional trends. We buy a Democratic newspaper because we are Democrats and Republican sheets because we are Republicans. Most of us are unreasoning beings given over to the power of suggestion, and almost the strongest suggestion acting upon us is that which binds us in our group. We do not much criticize suggestions which we want to hear; we only criticize and cast out suggestions antagonistic to our preconceived emotions and our aims. These conditions largely are the psychical material which underlie the making of a neurosis. Many of the neuroses we see in civil life might be called litigation neuroses; the accident is often only the peg on which the neurosis is hung. It is of course fitting that persons injured through the negligence of another should be properly compensated for their disability. It is, however, natural that the temptation to bring spurious or exaggerated claims is great. Nervous disorders following accident are accompanied by many difficulties both in and out of court. Each man has, if he be dishonest, his price. However, on the other hand, if honest, a man has his saturation point of trauma. A succession of injuries may break down his

morale and give rise in him to fixed fear trends, which put an end to his earning capacity, sometimes, and always reduce his usefulness.

Ericksen was the first to write of the nervous manifestations incident to railway accidents. He wrote in the time when men's thoughts were entirely materialistic and he believed that these symptoms were due to disturbances of the molecular elements of the cord. This narrow and improper view was challenged by Page who energetically demonstrated that most of the curious nervous symptoms seen after railway accidents were the more or less immediate concomitants of the profound mental emotion aroused by the traumatic character of the occurrence. Strümpell and Oppenheim then described the clinical picture following general commotion of the nervous system, as "traumatic neurosis." In these early discussions of the subject the importance of suggestion on the mind of the patient was inadequately weighed but out of these discussions the truth gradually emerged that even after *the slightest* injuries general functional disorders not infrequently could occur. Such neuroses are not disease pictures of any special type but may all be classified under the name of other well recognized conditions, of which the most important, to use old-fashioned names, are hysteria, neurasthenia or anxiety states, hypochondriasis and other mixed types of depression. Incidently there is a crying need for better definition of terms used in psycho-pathology. Neurasthenia has been used for a generation to cover almost all abnormal states of a highly depressed and anxiety character and hysteria is too often identified in the minds of both doctors and laymen as malingering. Both of these words have become the battered ornaments of medical speech, but on the whole they have greater precision of idea and a larger vitality than can be claimed for many neologisms coined of late by the new psychology.

Speaking broadly, we can divide the neuroses following accident into two groups, (1) the neurasthenic anxiety state including all abnormal generalized emotional condi-

tions following injury; and (2) hysteria following injury, including those cases in which abnormal emotional states have become modified by the development, through suggestion, of some functional deterioration of a localized character.

Much may be learned of nervous instability in general from that occurring in soldiers in war. After 1916 confusion arose from the common acceptance of the word "shell shock" to cover all cases of nervous instability occurring in the course of war. Under this heading were mixed cases of amnesia, anergic stupor, sleeplessness, nightmare, mutism, functional blindness, tremors, palsies and anxiety states, occurring not only under fighting strain but also in individuals who failing in self-confidence suffered thoughts and apprehensions while still awaiting transportation over seas.

The most important fact in war neuroses and, in my opinion, this applies also to industrial life, is that *almost never were generalized psychoneuroses seen in soldiers suffering also from physical wounds of any consequence or degree.* After shock or strain the degree of emotional destabilization varied inversely as the amount of gross physical injury.

On the other hand, minor injuries sustained in danger under great emotional and physical tension may become psychically elaborated without any conscious desire to malinger. Almost all injuries of the extremities in my experience were accompanied for a short period by a natural "defense immobilization" of the limb; natural reaction from pain in tired persons. A flesh wound of the upper arm, for instance, easily produces in such men the impression of inability to move the wrist and hand. Any doubt expressed by the physician—or even by a lawyer (*sic*)—as to whether or not, for example, an injury to the brachial plexus might not possibly account for the condition of the hand, sows the seeds of a fixed idea which later may assume a very sturdy growth. To the weaker kind of men a minor wound offers an opportunity of tem-

porary alleviation of their lot in war, and among the same order of people in peace time it may develop an idea of grievance against the civilian employer or the rich corporation, which should have carried him about his business in safety; and there may be added early shadowy ideas of financial opportunities then open to him. In the soldier and civilian of the feebler fabric of humanity there may thus be produced an emotional condition in which suggestions tending to augment the gravity of the injury in question are readily acceptable nor are they willingly submitted to critical judgment or experiment which might possibly establish their trivial character. It is not out of place, therefore, to point out here the importance of having these patients seen as quickly as possible by someone with *accurate technical knowledge.*

The power to make a careful physical examination, to weigh evidence with precision, to differentiate sharply organic from psychical symptoms, is the only power which will give the physician enough self-confidence to be able to communicate healing to his patient. Time and again has one seen a half doubt in diagnosis preventing the coming together of physician and patient. If the physician be not entirely certain of the nature of the functional or psychical condition, his power to cure it will be inhibited by his suspicion of an organic nerve lesion on the one hand or conscious malingering on the other.

In short, functional motor and sensory palsies and functional perversions of the special senses are created by "localized suggestion" directed towards an affected faculty or member, and can be cured by like means and only by like means. To distinguish them quickly from similarly appearing organic states is the first and most important step in their treatment and one which, having been taken firmly and accurately, will give the physician the authority and self-confidence needed to exorcise the system of false ideas immediately producing the condition. I say "immediate," for in these cases due to localized suggestion there is an underlying mental conflict, the strain of which pro-

duces in other men anxiety states or other psychoneurosis, still more disabling for civil or military duty.

We are indebted to Freud and his school for the rediscovery that neurotic symptoms may be produced by the antagonism of mutually incompatible emotional trends. The great mass of material made available by war demonstrates the general rightness of this principle, but still more definitely displays the peculiar wrongness of the detail with which it has been applied, and entirely invalidates the conclusions—asserted as pontifical dogma—that the sexual instinct, albeit in various disguises, is the only dynamic force possibly concerned.

The emotions associated with acquisitiveness and with gregariousness or group-loyalty operate powerfully after civil injury, and make it obligatory on all having to do with such patients to see to it, that accurate diagnosis be established by expert physicians, and second, that final adjustments of all claims for compensation be made quickly. The writer—as a physician—strongly deprecates the system of giving weekly stipends to persons suffering from nervousness following injury. Compensation should be awarded as soon as diagnosis has been established; it should be in bulk as a single sum, and if possible the case should be closed beyond reopening, to allow "litigation neurosis" to disappear.

It is of course possible in severe violent accident that any part of the body may receive physical injuries of any severity. Functional nervous disorders may complicate such injuries but here again one may see that the more severe the physical injury the less likely will it be complicated by functional affections. Such affections may follow a fall on the sidewalk, or the mere witnessing of, without sharing in, some catastrophe. They may occasionally develop through fear and suggestion when no thoughts of litigation exist; on the other hand, prolonged neuroses have been quite rare as the aftermath of such terrific natural catastrophes as earthquakes where the perpetuation of pecuniary aid was impossible.

In ordinary depressive states one often finds that the nervous system has never been entirely stable or that it has become more susceptible to disease influences through the weakening effects of excess or strain. Undoubtedly the weakling is more prone to develop neurosis after injury than is the man of strength, originality and character but one must remember that limited nervous reserves are often found in finely constructed bodies. On the other hand, every man is suggestible and, as with metals, has his modulus of elasticity and strain. Often as a result of profound fright or after a long period of conflict and strain, there may come a situation carrying with it such emotional disorder as renders helpless the will-power to endure. Such a case was that of an officer of my acquaintance who, having borne the racking experience of the landing and trench fighting at Gallipoli, one day, when jumping to what he took for solid ground, found himself—as he put it with a gesture of infinite disgust—squelching thigh-deep in decomposed Turkish dead. For weeks this experience recurred to his consciousness, both by night and by day, and in dreaded interruption to his normal train of thought, rendering him for that period incapable of duty, a prey to the paralyzing influences of both repulsion and fear.

Associated with such symptoms, or often occurring independently, are various losses or perversions of localized function usually classed as hysterical stigmata. These may persist after the patient has resumed superficial emotional control. On the whole, however, mutism, deafness, blindness, functional monoplegia, paraplegia and hysterical spasms of the limbs are the result of localized suggestion rather than of a generalized anxiety state.

A false idea of injury accepted by a patient over a long period and supported by apparently good evidence and authority is often difficult to remove. The suggestion of injury may be so elaborated and so firmly agglutinated to the mind that it is next to impossible to lift it out.

Disabilities, the result of improper or incorrect suggestions accepted in good faith by the patient, are not ma-

lingering. For example, a young gunner was wounded in May, 1915 by a shell fragment on the inner side of the left upper arm. For eight weeks the arm was held by apparatus in a horizontal position to allow of irrigation and dressing. It was then found to be completely paralyzed, atrophic, hairy, and cyanosed. The patient was examined by numerous medical boards, was invalided out of the army and awarded a pension on the basis of total paralysis of the left arm. The British Red Cross secured for him a position as elevator boy, the duties of which he could accomplish easily with his right hand. He was entirely satisfied with his treatment and he was content, to say the least of it, that the war had done no worse by him. He was allowed to seek aid from military hospitals if he wished, and in February, 1918, he came of his own accord to a London hospital to which I was temporarily posted, to ask that the arm should be taken off at the shoulder, as it interfered grievously with his activities, and, as he said, because he was tired of putting his useless arm into his sleeve. He was referred to me by the surgeon who saw him, to know if it would be worth while to dissect the brachial plexus, which presumably was caught in the scar of his wound, rather than accede to his demand that his arm be amputated. Examination revealed that the trapezius was paralyzed, together with all the muscles of the arm itself, a condition which clearly could not come from an injury to the nerves below the level of the shoulder. In short, his only organic ailment was a partial ulnar paralysis and minor secondary adhesions in the shoulder joint through immobilization. The rest of the paralysis was induced by his belief, inculcated by every consultation, that he could not move the arm. This man had nothing whatever to gain by the removal of the arm at the shoulder, and is a case to be remembered when we too lightly identify patients with hysteria or suggested paralysis with malingerers.

The perversions and abrogations of function due to localized suggestion are of all types. Further the suggestions producing these conditions are most varied. Identical dis-

abilities may come, through a trivial blow, or as a result of a more serious injury, from the diagnostic or verbal indiscretions of a physician.

Indeed, the chief characteristic of the hysterical mental state is suggestibility. The patient is constantly subject to such influences similar to those used in hypnotism. This is certainly the most adequate explanation for the origin of the disorder; by it can be explained such symptoms as are purely psychic manifestations. Thus, an actor, 47 years old, fell from the flies of a theater on his back; he was not seriously hurt but two days later became aphonic, a condition which lasted several months. He then had the misfortune to fall from a moving train. On this occasion he received no demonstrable physical injury but was very much astonished to find he could talk as well as ever and has had no difficulty in speaking since.

Exaggerated psychic manifestations of trance, catalepsy, alterations of personality, and the like, are only occasionally observed in hysteria, provoked by accident; memory may be much impaired, there may be forgetfulness of the accident, and subsequently there may be periods of almost total amnesia. It is essential to understand that according to our modern notions of hysteria, the derangement of sensory function does not imply any derangement of the sense organs themselves. It has been abundantly proved that a patient with hysterical blindness sees; that sensations from anesthetic skin areas are received if not perceived, just as we are unaware of the roar of traffic about us when immersed in an interesting novel. It is useless, however, to enter into theoretical speculations on the physical pathology of hysteria. Nothing is known regarding *anatomical* changes responsible for the symptoms of this disease. Of late years I have often wondered how strangely the sequelae of epidemic encephalitis mimic certain hysterical phenomena. So that it would almost seem as though in some of these cases the individual expresses himself less through his recently acquired nervous system and more by the antique structure of the brain situated in

and below the basal ganglia. However such ideas are as yet entirely speculative.

The psychic character of a profound left hemianesthesia was well demonstrated in one of my patients who, during my rounds, was sitting propped up in bed with her arms crossed. When the arms were pricked, her eyes being closed, she felt nothing in the right arm which was lying in the left anesthetic field, and, until she discovered her mistake, felt accurately in the previous anesthetic left arm, which lay in the field of normal sensation.

Janet ascribes these palsies of special sense to diminished powers of attention in the patient, who, as a concentrative measure cuts out of his sphere of consciousness a stream of incoming sensations. If the circumstances of the onset and development of hysterical symptoms be analyzed, one will usually find some factor of concrete local determining character. It is proper, however, to point out that while we may understand a man who has struck his friend following subconsciously the Biblical command to "cut off his right hand," we cannot as yet determine the exact elements in that man which make it necessary for him to adopt this self-denying ordinance, in contrast to those who do not. Hysteria is, however, always a refuge from a reality unacceptable to the patient, whence it follows that hysteria rarely or never occurs in him who faces issues squarely, nor ever seeks to evade consequences by self-deception. Hysteric blindness is prefaced by blindness to facts and ideas, and is an inadequate solution or postponement of an unpleasant problem, by a weak personality; it may also be a vehicle to bear the patient to the oblique attainment of an illegitimate desire.

Allied to hysterical anesthesia, of which by the way, the patient rarely spontaneously complains, is hyperesthesia. In hysteria following injury there is very frequently found enormously exaggerated sensitiveness of the injured part. The slightest touch may produce evidence of extreme pain.

Disorders of special senses are usually unilateral and occur most frequently on the side of the body which is

already the seat of cutaneous anesthesia. There may be contracted visual fields for color. It is perfectly possible that many defects of special sense are unwittingly suggested to the patient by the physician in the course of examination. All types of motor paralysis, characterized sometimes by flaccidity, often by spasm, may occur. The skilled observer will soon appreciate that these motor symptoms do not follow organic lines. The reflexes are unchanged. A complete hemiplegia, for instance, may exist with normal abdominal reflexes on the affected side and no alteration of the plantar reflex on that side. Astasia abasia, a term invented by Blocq, is a hysterical affection of the legs in which, although retaining their power in other things, they are unable to support the body in standing or walking. In this condition anesthesia is usually absent.

There is usually an interval between the occurrence of an accident and the development, in fine flower, of the disease picture; an interval called by Charcot, the period of meditation, during which insidious suggestions play their part. It is during this time, however, that the patient's mind can best be turned from the contemplation of his own misfortune. Thus mental supervision together with ordinary simpler methods of therapeutic change can in many cases banish the early symptoms instead of allowing them gradually to become worse. It must always be remembered, however, that the neurotic has a lowered threshold of mental and emotional stimulation and that some few cases develop true hyperthyroidism after shock.

It is not surprising that the claim agents, or the lawyers for a company, whose medical knowledge must at least be superficial, and who so constantly are witnesses of attempted frauds, should be skeptical as to the justice of claims which are oftentimes based upon symptoms the existence of which cannot be definitely proved. Even physicians, without special experience in general nervous disorders do not appreciate the possible gravity of such conditions.

When the functional and subjective nature of the traumatic neuroses first became the subject of general interest, simulation was supposed to occupy an important place in their genesis. It was not then, however, properly appreciated that malingering is the conscious, and hysteria the subconscious assumption of a disease picture. Suggestion and wishful thinking make gross conscious deception unusual, and indeed to some extent even unnecessary.

Prognosis

It is undoubtedly true that the traumatic neuroses usually begin to improve when litigation has ended, and of all remedies financial compensation is the most speedy and the most certain in its action. An attempt has been made before to show how a delusional system of ideas held for a long time and supported by what the patient regards as authority is often difficult to remove. One may say that without closing litigation and satisfying the patient economically, such a delusional system of ideas cannot be cured, and occasionally even though the emotional atmosphere be made satisfactory by the above circumstances the bad tenant of a neurasthenic idea may be difficult to evict. Dr. Raphael Lewy, chief medical examiner for the Compensation Commission of the State of New York, even goes so far as the following: "I have stated in referring to my article on neurosis following trauma, that I cannot conceive how disease can be ended by monetary remuneration. On reconsidering the matter, however, I realize that such monetary remuneration must be considered as a therapeutic agent to help the individual to dissociate his mind from his functional neurotic condition. . . . Indeed, I do not know of a single case, from my very large material, which was ever disposed of unless the individual received a monetary remuneration to his own satisfaction. I may also state that in some cases the remuneration did not dispose of the case, as the individual endeavored to reopen his case after having disposed of the money which he had received."

The hopes for recovery of health are enormously better if there be no question of litigation, and if the proper moral influences can be brought to bear on the patient immediately after the accident. Under these circumstances the outlook for recovery should be very good. Preceding organic disease, especially arteriosclerosis, renders the process more grave.

Treatment

How does one cure a paralysis due to a false system of ideas or a loss of special sense due to suggestion, or a fear state due to the agitation of litigation and anxious hope? The removal of objective by closing litigation is the first requisite. After that we need accurate technical knowledge. That is the only power that will give men trained like you and me the power to cure symptoms due to disordered thinking and feeling. It is through knowledge of the body that we doctors can acquire sufficient confidence in ourselves to cure the mind. Have you ever wondered wherein lies the power of the quack; wherein lay the power of, for instance, M. Coué? It lay in his ignorance. I am not being ironical when I say that, nor am I being harsh with M. Coué whom I respected. I am being what I believe to be completely truthful—his power lay in his ignorance. I spent much time with M. Coué, watching him and seeing his methods. All cases of paralysis, for instance, looked alike to him. He paid no attention whatever to whether a person had an hysterical or a spastic paraplegia. To him they were the same. He told them both that they would get entirely well. The hysterical paraplegia got well—and Coué remembered him; the spastic paraplegia did not get well and Coué forgot him. He had the very antithesis of the scientific mind, in that he gathered up into his mental furniture only those cases that aided his thesis; so he went from peak to peak of success in his own mind; he cured a great many people because he believed he could cure them and because he saw no reason why he should not believe that he could cure them, because he always forgot the cases he did not cure.

Now we doctors have been brought through the schools. When we see a case of paralysis we see always along side of it in our minds, a microscopic section of hopelessly degenerated tissue. You see we have suffered an exposure to pathological knowledge. Therefore when we see loss of function at the bedside, we see at the same time in our mind's eye the loss of structure, as shown by the microscope. That knowledge, that visual image inhibits us from telling that man to take up his bed and walk. We feel a little foolish because we feel that perhaps he will not take up his bed and walk, by which we would lose both his respect and respect for ourselves. So, if you have not accurate technical knowledge you may *suspect* you are dealing with an hysterical paraplegia but if you are not *certain* you say to him, "My dear Sir, don't you think you could walk?" And the man hears the doubt in your voice, he sees you have no iron in your soul, that you have no personal conviction, and he says, "No, of course I can't." But, if the quack goes to him and says, "Get up, you can walk," he feels conviction, he hears the ring of truth. He gets up and he walks, if his paralysis is due to a false idea which he has nourished. Therefore, in the examination of these cases it behooves us all to have a neurological scheme of examination whereby the nervous system can be examined with as much accuracy and as much system as are the heart and lungs. If you have such a scheme, such a mode of attack, on a case suspected of being neurological many errors would be avoided. Further, in examining a neurotic, after an accident, don't only consider the accident and the man before you, but what kind of a wife has he? is there a mortgage on his house? is he in debt? How much savings has he? Are his children ill? The conclusion may lie in his wife's bad temper. And that may be due to her bad health or his bad manners.

Hysteria and malingering are often dove-tailed and come together in one mind, and many symptoms begun as malingering end as hysteria by suggestion. In the great majority of cases one cannot tell easily what is virtue and what is vice. Just as few of us know if we are all good

or all evil, we are in truth neither white nor black, just gray.

Sometimes we need resource and invention to deal with novel situations.

Shortly after the war a patient, said to be a Central European who had served in the United States Navy, was sent to me at the Neurological Institute from the Marine Hospital, for an opinion. He alleged he could speak no English, that he could understand no English, and that he could not walk but in a few words of English he maintained that his condition had come through war service. He demanded compensation for life on the plea of total disability. My examination failed to show any definite sign of organic disease. However, he certainly could not be made to stand, and he certainly seemed unable to talk English, or any language that I knew. I felt baffled, but most doubtful of his good faith. I therefore asked my house officer to pass into him the longest stomach tube he could find. Then there was poured one-half pint of Scotch whiskey into the end of the tube, the bottle being shrewdly wrapped in a towel so that he did not know what was being given him. In half an hour I returned to find the ward in an uproar and my friend up and about passing hilariously from bed to bed saying in a rich Milesian accent, that "this was absolutely the finest hospital he had ever been in."

I am afraid I have wearied your ears with a twice told tale, but indeed I have but set down in general terms the nature of this problem.

In doing so, only the psychological aspects have been regarded because these are more accessible and in a sense more malleable than the underlying physiological change upon which they must depend. I am not unmindful of the flux in the balance of the involuntary nervous system, the alteration of glandular function, the cardiac arrhythmias nor even the dyspneas accompanied by increased absolute blood acidity—but of such things we lack knowledge

precise enough for action. As yet they throw no light on the intrinsic nature of the mind. Therefore, perforce we must deal with mental phenomena rather than with Mind and apply with some empiricism psychological remedies to psychological ills.

THE SURGICAL INDICATIONS FOR SYMPATHETIC GANGLIONECTOMY AND TRUNK RESECTION IN THE TREATMENT OF DISEASES RESULTING FROM VASOMOTOR SPASM OF PERIPHERAL ARTERIES *

ALFRED W. ADSON
Section on Neurologic Surgery, The Mayo Clinic, Rochester

The permanent increase in surface temperature, the result of increased flow of blood following sympathetic ganglionectomy and trunk resection, has aroused new clinical interest in the treatment of peripheral vascular diseases. Besides the accepted vasospastic disorder in Raynaud's disease, numerous diseases which affect the extremities develop as the result of impaired circulation. Careful distinction should be made between diseases that arise from vasospastic phenomena and those that result from an occlusive lesion of the blood vessels. Only in cases in which vasospastic disturbances are present will benefit be derived by section of the sympathetic fibers of the arteries.

SURGICAL PROCEDURE

The surgical procedure employed consists in thoroughly interrupting the vasomotor impulses to the arteries of the extremity to be treated. These impulses are carried over the thoracicolumbar sympathetic outflow, by white rami communicantes, as preganglionic fibers, to end in synaptic relation with the thoracic or lumbar sympathetic ganglions. The impulses are then carried by postganglionic,

* Delivered October 9, 1929.

gray fibers, which also include fibers supplying the pilomotor muscles and the sweat glands, to reënter the spinal nerves, and to be distributed with the spinal nerves in the somatic musculocutaneous distribution.

Thus, to destroy effectively the vasomotor control of the arteries, it is necessary to section the gray rami, or the preganglionic or postganglionic fibers before they reenter the spinal nerves for their final distribution to the arterial system. Jaboulay and Leriche, in their early work, attempted to accomplish this by periarterial sympathetic ganglionectomy. They believed that the innervation was centrifugal or centripetal in distribution, but since the anatomic studies of Kramer and Todd and Potts, who showed that the distribution corresponded to the musculocutaneous distribution of the spinal nerves, it is easy to understand why so many results were incomplete, as only a few of the vasomotor fibers were interrupted. Leriche and Fontaine still believe there is an intramural ganglion of the arterial wall that has to do with vascular tone. Ransom stated that there are sensory fibers, carrying impulses from the viscera to the spinal cord, which have their ganglion cells in the dorsal horn of the cord and pass inward through the white rami; this accounts for the partial or total relief of pain in angina when the stellate ganglion is removed. I would like to believe that a similar arrangement of sensory fibers is connected with the arteries, in order to explain the sudden relief of pain that follows sympathetic ganglionectomy, but Orbeli believes this is due to the lowering of the sensitiveness to pain.

Royle,[19] in attempting to relieve spastic paralysis, introduced the operation of ramisection; but since the gray rami are not constant in origin or distribution, it became apparent that many fibers were overlooked during the operation. Hence, Adson and Brown [1] introduced ganglionectomy and trunk resection to assure completeness. Thus, in treating a lesion of both lower extremities, I would perform bilateral lumbar ganglionectomy, including the second, third and fourth lumbar ganglions, besides

resecting the accompanying lumbar sympathetic trunk. This procedure thoroughly interrupts all postganglionic fibers descending to the lumbar and sacral nerves. The lumbar ganglions do not receive preganglionic fibers below the second lumbar ganglion. Simple section of the sympathetic trunk below the second lumbar ganglion would be sufficient if it were certain that these lower ganglions did not receive stray postglanglionic fibers from the first lumbar ganglion. It is believed wiser to err on the side of safety by doing too much rather than too little, since complications from this operation do not arise.

More difficulty was encountered in the treatment of vasospastic diseases of the upper extremities than was encountered in treating those of the lower extremities, since the anterior or lateral approach to the stellate, cervicothoracic ganglion did not always permit of complete removal of the ganglion or thorough interruption of the vasoconstrictor fibers to the extremities. Neither did the Royle [20] ramisection of the brachial plexus accomplish the desired results. An operation needed to be devised to permit sectioning of the thoracic sympathetic trunk below the second thoracic ganglion, since Kuntz had demonstrated gray fibers passing to the first thoracic nerve directly from the second thoracic ganglion. July 31, 1928, I performed such an operation for Raynaud's disease. A posterior approach into the mediastinum was employed. After resecting the second rib in close proximity to, and including, the transverse process, the second thoracic ganglion, the first thoracic ganglion, and the lower cervical ganglions were removed with the intervening sympathetic trunk. Since then, numerous similar operations have been performed. Even though this operation was extensive and should have included all vasoconstrictor fibers to the head, neck and extremities, the occasional Horner's syndrome failed to remain permanent after the operation. This suggested that gray, postganglionic fibers were entering the carotid plexus; therefore I recently have changed the operative procedure by resecting the vertebral portion of the first rib instead of the second. The lateral portion of the trans-

verse process is also resected with the rib in order to facilitate the exposure, which permits entrance into the mediastinum opposite the first thoracic sympathetic ganglion. The first thoracic ganglion is then dissected free and the trunk resected just above or below the second thoracic ganglion, depending on whether the second is situated high or low with relation to the second thoracic nerve. If the second thoracic ganglion is not removed, the first thoracic nerve is carefully dissected from the intervertebral foramen to its juncture with the brachial plexus in order to interrupt thoroughly all gray rami that may ascend from the second thoracic ganglion. After elevating the thoracic ganglions and trunk, the entire lower cervical ganglion is resected with the chain. This alteration in the technic has produced a complete and permanent bilateral Horner's syndrome, and I hope has included all vasoconstrictor fibers to the upper extremities. The clinical results have been equally good with both technics. The anatomic studies of Kuntz have been verified by my associates and me; the lower cervical ganglion and the first thoracic ganglion are infrequently fused in man into the so-called stellate ganglion found in lower animals. This accounted for the incomplete results by the superior anterior approach, since only a portion of the ganglion, or only the lower cervical ganglion, actually was removed.

Vascular Index

In order to select suitable cases, some basis, or index, had to be developed which would serve as a measuring stick, not only to determine the presence or absence of vasospasm but to determine the probable results of an operation. The clinical skin-thermometer gave the changes in skin temperature. The Stewart-Kegerreis calorimeter gave the heat production and radiation before and after operation, but still the means of determining accurately the degree of vasospasm before considering the application of surgical treatment was lacking. Adson and Brown [1] then proposed the "fever test." Although the volume of blood that flows through the peripheral arteries cannot

be measured, it can be determined relatively by changes in skin temperature. This principle is employed in the fever test.

The patient is placed on a cot in a room in which temperatures can be taken accurately. The electrodes of constantan and copper of the electrothermocouple are then fastened to the various areas over the fingers, toes, hands, feet and body, in preparation for readings. The first readings record the room, skin surface and mouth temperature of the patient to be studied, in order to compare them with the readings of a normal person and to be further checked against the readings of the same patient at the height of the fever test. The fever is then produced by administering hypodermically a foreign protein; for example, 25,000,000 to 75,000,000 dead bacilli in triple typhoid vaccine, the dosage depending on the size of the patient. Hourly readings are made until the maximal rise of fever has been obtained. These readings are compared with the initial temperatures, to determine whether the elevation of temperature is that for a normal person, or is that for a patient with a vasospastic or occlusive disease. On studying the temperatures of a normal person, it will be observed that the mouth temperature will have increased to an average of 3°C., whereas the skin temperature over the digits will have increased 9° to 12°, or three to four times more than the mouth temperature, thus indicating that the peripheral arteries have been opened by relaxation of the vasomotor system and that more blood has been permitted to flow to the periphery.

In patients suffering from Raynaud's disease, a vasospastic disorder, the difference is still greater, since the initial surface temperature over the digits is lower than that of a normal person exposed to the same room temperature. In patients with general arterial sclerosis there may be little, if any, difference in the temperatures before and after administration of the foreign protein, indicating that the vessels are incapable of relaxing to allow increase of the flow of blood to the periphery. In case of thrombo-

angiitis obliterans it is possible to determine whether or not there exists a vasomotor spasm of the unoccluded arteries; it is possible, too, to determine, by individual readings, the condition of each digit. Therefore, this test serves as an index, and unless the rise in temperature of the skin over the digits is two or more times greater than the rise of the mouth temperature, the condition is considered inoperable. If, due to occlusive lesions or to permanent changes in the arterial walls, the febrile state fails to cause relaxation of vasomotor spasm, so will the operation fail.

Raynaud's Disease

Raynaud's disease represents the classic vasoconstrictor disturbance affecting the hands and feet. Little has been added to the original descriptions given by Raynaud in 1862 and in 1874. His studies brought out conclusively that there is a form of gangrene without demonstrable organic lesions or occlusion of the arteries. It is distinguished from the milder cases of vasospastic disorders of the extremities which simulate Raynaud's disease, but which, apparently, do not progress and are not sufficiently troublesome to warrant a surgical procedure. These include the minor cases of acrocyanosis in which the major disturbances consist in cold, cyanotic, moist hands or feet not accompanied by pain or trophic disturbances. Some persons have disturbances which occur chiefly in the winter months, and which are relieved by exposure to heat, change of location, or change of climate. These patients complain, chiefly, of attacks of pallor involving one or more digits, associated with numbness or aching, but they do not complain of severe pain or trophic changes. There is no contraindication to operating on patients of this group, but I am of the opinion, as is Brown, that sympathetic ganglionectomy should be employed only when the symptoms are progressive, incapacitate the patient, produce trophic changes, and when they fail to respond to the simpler medical procedures. However, it should be borne in mind that these mild, vasospastic disorders may

give rise to such diseases as scleroderma and chronic arthritis and, therefore, that they should not be ignored. The patients should be observed from time to time to prevent the abnormal conditions developing to such a degree that they are irreparable surgically.

Raynaud's disease is characterized by the presence of symmetric changes in color of the extremities. It may involve the upper, lower, or all extremities. Occasionally the knees, elbows, nose, and lobes of the ear are included in the process. The blanching of the skin is brought on by exposure to cold or by emotional influences. This soon is followed by the cyanosis which continues until the vasospasm subsides. In the early stages, this is accompanied by discomfort, then by an ache and finally by severe pain. As the disease progresses, the color changes become more marked and the skin remains more or less cyanosed unless the condition is relieved by application of heat externally. The gangrene in Raynaud's disease differs from the gangrene which occurs in occlusive lesions in that it produces dry ulcers at the tips of the fingers or toes, with distorted growth of nails, instead of complete gangrene of one of the digits. If the process is allowed to continue, the gangrene will ascend and will be extremely painful. The patient usually complains of subjective numbness, which interferes with the function of the extremity and adds to the general discomfort and incapacitation. The disease does not always progress to the severe forms; hence, the milder types may be controlled by changing occupation. If the patient is financially able to move to a warmer climate during the winter months, moving may control the disease. The addition of warmer clothing, or the application of heat, serves to ameliorate the symptoms. But the patient who has continuous symptoms and in whom trophic changes develop had better submit to the operation rather than to continue suffering. The surgical shock and risk is no greater than that of an ordinary laparotomy. During approximately five years, I have performed 162 operations on seventy-three patients, with only two deaths. Both of these occurred in patients suffering

with thrombo-angiitis obliterans. One was from pneumonia; the other, from postoperative ileus.

The results obtained are so satisfactory that they more than offset the inconvenience of the surgical procedure. The patient is immediately relieved of the pain, the cyanosis disappears, and the skin becomes warm, pink and dry. The ulcers heal and the nails take on normal growth. The patient again is restored to normal condition and can continue with his vocation. Since more than four years have elapsed since the patients were operated on, I am reasonably sure that the results will be permanent. I have never seen any postoperative sequel develop after lumbar ganglionectomy. The skin, of course, remains dry, which if it annoys the patient can be relieved by rubbing on oil, such as cocoa butter.

The Horner's syndrome follows cervicothoracic ganglionectomy. If this is bilateral the patient rarely complains, but if unilateral, it becomes noticeable and the patient may object to the disfigurement. In my earlier cervicothoracic operations, an occasional patient complained of ulnar pain following the operation. This has been controlled by avoiding trauma to the first thoracic nerve by opening the mediastinum in the line of the first instead of the second rib. In three cases venostasis has developed following thoracic ganglionectomy; I am unable to explain this definitely. Two of these patients previously had undergone bilateral periarterial sympathetic ganglionectomy and all three had experienced marked cyanotic color changes. As long as the hands are used in the ordinary positions, as over a table, while the patient is sitting, they appear normal, but if they are allowed to hang down along the body they become dusky red and appear to be stuffed. If they are elevated over the head, they become blanched and the skin becomes wrinkled. The capillaries, as seen in the nailfolds, are large dilated loops. The condition suggests some stimulation of the vasodilator nerve or loss of vascular tone which has resulted in permanent dilatation from the long-standing course of the disease.

This phenomenon does not detract appreciably from the result, since it is not accompanied by pain, nor does it interfere with the vocations of the patients. It has been observed, also, that there is additional dilatation of the retinal arteries and an increased supply of blood to the nasal mucous membranes which increases the mucous secretion. Neither of these conditions offers contraindication to the operation. On the contrary, it may suggest results desired in the treatment of retrobulbar neuritis and atrophic rhinitis.

Occlusive Diseases

There are two main forms of occlusive diseases of distal arteries, thrombo-angiitis obliterans, and arterial sclerosis with thrombosis. The rationale of carrying out sympathetic ganglionectomy in this group is based on the degree of vasomotor spasm of the unoccluded arteries, chiefly in the collateral vessels.

Thrombo-Angiitis Obliterans

In most of the cases of thrombo-angiitis obliterans, factors apparently were responsible for the diminished supply of arterial blood in the distal regions of the extremities. One of these factors was occlusion of the main arterial channels by the obdurating thrombus; the other was an abnormal degree of vasospasm of the collateral arteries. The relative significance of the latter factor was brought to my attention by the fact that in many cases of thrombo-angiitis obliterans the volume of blood flowing through an extremity, as measured by the rate of elimination of heat, increased markedly with increases of environmental temperature and during fever artificially produced by the administration of a foreign protein such as triple typhoid vaccine. Inasmuch as these factors suggested vasospasm of the collateral vessels, these patients were studied in much the same manner as those suffering from Raynaud's disease, except that the degree and rate of progress of the occlusive process was considered. Thrombo-angiitis ob-

literans occurs in adult life, has a predilection for young males, and is found in all races, but supposedly more frequently in Hebrews than in persons of other races. The etiologic factors have not all been determined. It is supposed that the lesion develops on a basis of infection of the intima of the arteries and that cigarette smoking is a contributing factor. But I am impressed with the fact that the lesion may also result as a trophic change due to disturbance of the sympathetic innervation. The thrombotic process varies in degree and distribution; it may affect the distal part of one principal artery or it may include all of the principal arteries of all extremities at different periods. The customary course is rather slow; the main arteries and veins of the feet and legs are affected, and later the upper extremities. If the patient has the time and the money, he can get on comfortably by discontinuing work, remaining at rest in bed, and applying heat or using vaccines, for in time canalization takes place and the circulation will be partly restored. But since many of these patients are compelled to work and to subject their feet and hands to trauma, trophic ulcers develop sooner or later and refuse to heal. These become infected, cellulitis develops, more thrombosis and gangrene appear, and amputation is inevitable. Therefore, if it is possible to relieve vasomotor spasm of the collateral vessels and thus to improve the circulation, ulceration, cellulitis and gangrene may be forestalled, and the healing of existing ulcers and abrasions may be hastened.

The ideal case for operation, then, is that of the patient who has moderate symptoms, thrombosed main arteries and veins and superimposed vasospasm of the collateral arteries with an index of two or more. It is unwise to perform the operation in the presence of an active, thrombosing process of short duration; the condition may ascend and may result in gangrene in spite of the operation. However, I believe that the improved and speeded-up circulation that results from sympathetic ganglionectomy diminishes the likelihood that a stationary process will be lighted up.

The desirable results of the operation, then, are as follows: Pain is relieved; circulation is improved; the color of areas of the skin changes from mottled reddish-blue to pink; the temperature of the skin is increased by two to ten degrees, depending on the degree of spasm; the ulcers begin to heal; the nails grow, and the patient obtains a new lease on life and is restored to his former status as a wage earner. Also the operation may prevent further gangrene and extension of the process in the opposite extremity, which is involved in a slighter degree than the extremity which gives the principal symptoms. It should be stated that the operation is not advised in milder cases, in which patients are not inconvenienced greatly, are free from ulcers and are able to carry on their regular work under symptomatic treatment.

Arterial Sclerosis

Arteriosclerotic diseases involving the legs, or so-called senile or diabetic gangrene, demand different considerations than the other forms of arterial disease. Senile gangrene occurs in patients who are in the later decades of life, their recuperative powers are less, and development of the collateral circulation, as demonstrated by Horton, is inadequate as compared with that in cases of thromboangiitis obliterans which occur in younger patients. Vasomotor changes are present in a much less degree than in the other forms. The vasomotor index is usually slight or zero. Therefore, I have not performed lumbar or thoracic ganglionectomy in cases of senile gangrene. It is possible that the operation might be indicated in selected cases, with the hope of relieving pain. The surgical risk would be greatest in this group on account of the age and the existing chronic diseases.

Scleroderma

Scleroderma is a disease of the skin characterized principally by pigmentary disorders, thickening, or atrophy, and it is frequently associated with sclerodactylia. The distribution may be circumscribed, spotty and diffuse,

limited to the feet and legs, or it may involve the hands, arms, face and neck, and the skin over the upper part of the chest. The muscles and bones may be included in the atrophic and degenerative process. The course of the disease is usually slowly progressive. It occurs at all ages but more frequently in young women.

It is not certain that all cases of scleroderma result from disturbances in the involuntary nervous system, but the lesions which develop in the extremities, feet, legs, hands, arms, and face frequently are preceded by vasospastic phenomena characterized by cold, sweaty, cyanotic hands and feet, simulating the symptoms of Raynaud's disease. We have also observed it in patients suffering from thrombo-angiitis obliterans, chronic arthritis, and in those with causalgia due to irritation of the brachial plexus by cervical ribs.

Therefore, in view of the fact that scleroderma develops in the presence of conditions which arise from vasomotor disturbances of the vasospastic type, we felt justified in carrying out ganglionectomy. The same vascular studies are made as those which are made in Raynaud's disease, but the indexes are lower than those of Raynaud's disease. These differences are due to thickening of the skin and to strangulation of the arterioles. The early cases have responded satisfactorily to treatment, but the advanced cases have not improved to the same degree. Difficulty has been experienced with healing of the surgical wound in three cases but this has been overcome by leaving the sutures in place longer than usual and by strapping the skin to avoid tension on the margins of the wound after removal of the stitches.

The results are those of immediate vascular improvement, and loosening and thinning of the skin over the extremities, face, and neck. The skin and muscles of the face lose their drawn expression, the mouth can be opened wider, and the tongue can be protruded. The improvement continues for months as the skin is gradually restored to normal. I have not operated on a sufficiently large num-

ber of patients to draw final conclusions, but I am convinced that the operation is indicated and will relieve the symptoms of scleroderma in all early cases in which there are histories of vasomotor disturbances, and that it will check, if not improve, the condition in the moderately advanced cases. The operation will not help in the advanced cases with vascular indexes of zero; thus, if sympathetic ganglionectomy is to be employed in the treatment of scleroderma of vascular origin, it should be employed as soon as the disease is recognized, to prevent its progress, for if it is permitted to continue, it usually results in continuous ulceration, gangrene, pain, deformity, and total invalidism.

Chronic Arthritis

Among the various types of patients with arthritis is a group of young adults who have painful, swollen, tender joints associated with limited motion, atrophy of muscles, and loss of function. The patients also complain of cold extremities, mild acrocyanosis and excessive perspiration, with aggravated symptoms, during stormy weather. The disease in this group may be referred to as chronic polyarthritis of the periarticular type with vasomotor disturbances. There is a tendency for the condition to progress slowly; it is not altered by the removal of foci, immobilization, massage or exercises, and is only symptomatically relieved by vaccines and application of the various types of heat. Therefore, inasmuch as several of these patients presented vasospastic phenomena in addition to arthritic symptoms which had not been relieved by the usual methods employed in the treatment of arthritis, Rowntree and Adson [16] [17] [18] felt justified in applying sympathetic ganglionectomy as used in the treatment of Raynaud's disease. To our delight, we were able to relieve these symptoms by causing improvement in the circulation. The skin became warm and dry, the pain was gradually relieved, the tenderness disappeared, the swelling subsided, the atrophied muscles recovered, and motion and function returned. The same vascular studies and indications were

employed as were employed in the treatment of other vasospastic disorders.

It is possible that the operation may be indicated in selected early cases of osteoarthritis as well as in moderately advanced cases, to relieve pain and to improve the circulation, thus offering assistance in the recovery from arthroplasty.

Causalgia

Causalgia is a painful condition that develops following trauma to peripheral nerves; supposedly it is limited to the median nerve. The pain is associated with local tenderness, glossy skin, muscular spasm and tender, rigid joints. Injections with alcohol, of the nerve involved, have given very little relief. Periarterial sympathetic ganglionectomy has offered occasional relief. But since this operation is limited in scope, twice I have performed unilateral cervicothoracic ganglionectomy by the posterior approach for causalgia of the ulnar and median nerve due to irritation of a cervical rib. In both cases definite vasospastic phenomena were present; in one case a finger had been removed for gangrene. Both patients had had previous operations on the cervical rib with only partial relief. Following the ganglionectomy, both were relieved of symptoms. The pain was relieved, the skin became warm and dry, muscular spasm disappeared, and function was restored. To draw any conclusion from only two cases is unwarranted, but the result is suggestive of a vasospastic factor being the underlying cause.

Erythromelalgia

Erythromelalgia is a syndrone characterized by intermittent attacks of vasodilatation of the arteries and veins of the hands and feet, symmetric in distribution, and associated with a severe, burning sensation of the skin. The skin has a mottled appearance, as if there were alternating periods of normal vasomotor tone and marked vasodilatation. During the attacks, the skin is red and the

veins dilated and throbbing. Relief is obtained by immersion of the parts in cold water and elevation of the limb.

Since the arteries are dilated, I have not performed ganglionectomy in a true case of erythromelalgia, but I did perform it once in a patient who had what appeared to be a mixture of Raynaud's disease and erythromelalgia, alternating with symptoms of vasospasm and vasodilation. The results were rather discouraging because the patient complained more of hot feet after the operation than she did before the operation. The disease is a vascular one but probably is of the vasodilator rather than the vasomotor type. Further study is necessary before offering anything specific in the way of surgical treatment.

Summary

The factors of vasospasm and impairment of the circulation undoubtedly give rise to or contribute to the production of Raynaud's disease, thrombo-angiitis obliterans, scleroderma, chronic periarticular arthritis, and causalgia, and sympathetic ganglionectomy and trunk resection are justifiable procedures when palliative measures are inadequate. The results depend on the extent of the disease and the degree of vasodilatation accomplished by the operation; the extent of the disease can be determined and the effect of operation can be forecast, preoperatively, by means of careful vascular studies.

BIBLIOGRAPHY

1. Adson, A. W., and Brown, G. E.: The treatment of Raynaud's disease by resection of the upper thoracic and lumbar sympathetic ganglia and trunks. *Surg., Gynec., and Obst.*, 1929, xlviii, 577-603.
2. Adson, A. W., and Brown, G. E.: The treatment of Raynaud's disease of the upper extremities: successful treatment by resection of the sympathetic, cervico-thoracic and second thoracic ganglions and the intervening trunk. *Jour. Am. Med. Assn.*, 1929, xcii, 444-449.
3. Allen, E. V., and Brown, G. E.: Erroneous diagnosis of Raynaud's disease in obliterative vascular disease (Thromboangiitis obliterans) I. Vasomotor disturbances simulating Raynaud's disease. *Am. Jour. Med. Sc.*, 1927, clxxiv, 319-329.

4. Brown, G. E., and Adson, A. W.: Calorimetric studies of the extremities following lumbar sympathetic ramisection and ganglionectomy. *Am. Jour. Med. Sc.*, 1925, clxx, 232-240.
5. Buerger, Leo: Thrombo-angiitis obliterans; a study of the vascular lesions leading to presenile spontaneous gangrene. *Am. Jour. Med. Sc.*, 1908, cxxxvi, 567-580.
6. Jaboulay: Quoted by Leriche.
7. Jonnesco, Thomas: Traitement chirurgical de l'angine de poitrine par la résection du sympathique cervico-thoracique. *Presse méd.*, 1921, xxix, 193.
8. Kramer, J. G., and Todd, T. W.: The distribution of nerves to arteries of arm with discussion of clinical value of results. *Anat. Rec.*, 1914, viii, 243-254.
9. Kuntz, Albert: Distribution of the sympathetic rami to the brachial plexus; its relation to sympathectomy affecting the upper extremity. *Arch. Surg.*, 1927, xv, 871-877.
10. Leriche, René: De l'élongation et de la section des nerfs périvasculaires dans certains syndromes douloureux d'origine artérielle et dans quelques troubles trophiques. *Lyon chir.*, 1913, x, 378-382.
11. Leriche, René, and Fontaine, René: Experimental and clinical contribution to the question on the innervation of the vessels. *Surg., Gynec., and Obst.*, 1928, xlvii, 631-643.
12. Leriche, René, and Heitz, J.: Résultats de la sympathectomie périartérielle dans le traitement des troubles nerveux post-traumatiques d'ordre reflexe (type Babinski-Froment). *Lyon chir.*, 1917, xiv, 754-792.
13. Potts, L. W.: The distribution of nerves to the arteries of the leg. *Anat. Anz.*, 1914-1915, xlvii, 138-143.
14. Ransom, S. W.: Anatomy of the sympathetic nervous system with reference to sympathectomy and ramisection. *Jour. Am. Med. Assn.*, 1926, lxxxvi, 1886-1890.
15. Raynaud, Maurice: Local asphyxia. London, New Sydenham Society, 1888, 1-150.
16. Rowntree, L. G., and Adson, A. W.: Result of bilateral sympathetic ganglionectomy and ramisectomy for polyarthritis of the lower extremities. *Proc. Staff Meetings of Mayo Clinic*, 1928, iii, 333-334.
17. Rowntree, L. G., and Adson, A. W.: Chronic infectious arthritis treated by lumbar sympathetic ganglionectomy and trunk resection: report of a case. *Proc. Staff Meetings of Mayo Clinic*, 1929, iv, 186-187.
18. Rowntree, L. G., and Adson, A. W.: Polyarthritis: Further studies on the effects of sympathetic ganglionectomy and ramisectomy. *Jour. Am. Med. Assn.*, 1929, xciii, 179-182.
19. Royle, N. D.: The treatment of spastic paralysis by sympathetic ramisection. *Surg., Gynec., and Obst.*, 1924, xxxix, 701-720.
20. Royle, N. D.: The surgical treatment of Raynaud's disease and similar conditions. *Med. Jour. Australia, Suppl.* ii, 341-343.

THE ENDOCRINES AND THE VEGETATIVE NERVOUS SYSTEM *

WALTER TIMME
Senior Attending Neurologist, Neurological Institute

While it is commonly accepted, even by the most conservative, that the endocrine system and the vegetative nervous system are closely correlated embryologically, physiologically and clinically, yet the actual contacts are not always simple to prove. Furthermore it is most difficult to establish whether internal secretory products can produce their effects without the necessary presence of the vegetative fibres by direct mediation through the blood stream or not, and whether vegetative fibres can produce their effect without glandular collaboration. In some cases, such as the necessary presence of normal splanchnics for the adequate adrenal effects—as shown by Cannon—the matter is quite clear, but in the thyroid or pituitary domain much confusion exists. In the case of the thyroid for instance it had always been thought that the vegetative fibres from the cervical sympathetic were in direct contact with the acini of the gland. Now, Nonidez confronts us with evidence that these thyroid cells are absolutely free from direct vegetative fibres—these latter passing exclusively to the blood vessels of the thyroid. The effects therefore obtained by Cannon and his co-workers by connecting the central end of the phrenic nerve with the peripheral end of the cervical sympathetic and obtaining by this means methodical and regular impulses passing through the phrenic via the sympathetic to the thyroid—a hyperthyroid effect with all its concomitants even to a unilateral exophthalmos—seem to have been produced through the intermediary of an enlarged blood supply to the vessels of the thyroid and not to its secreting cells—if Nonidez is right.

But other papers of these sessions will take up the morphology, physiology and pharmacology of the vegetative nervous system and the internal glandular connec-

* Delivered October 10, 1929.

tions, and therefore I will limit myself only to the one cited instance of the difficulty in getting at the actual facts of the relationship between the two systems. My function is to present to you in as concise a manner as possible what appear to the clinician as effects of a disturbed vegetative nervous system in relation to the internal glandular system, as these perturbations affect the individual. That many errors of deduction will enter such an exposition of course goes without saying, but perhaps enough material may be shown to illustrate disturbances which at least apparently belong to this group of reciprocal activities.

Because of the similarity of embryological development between the cells of the sympathetic system and the chromaffin cells of the adrenal glands, it is meet that we begin our discussion with the adrenals. Cannon showed that adrenalin stimulates the sympathetic system, and that stimulation in turn produces the various effects of such sympathetic activity, *viz.*, the coagulation time of the blood is diminished, blood pressure is heightened, blood sugar is mobilized in the blood stream, there is produced a change in the distribution of the blood mass, so that it is found mostly in the muscles and in the nervous system and is much diminished in the abdominal organs causing a cessation of activity there. All these facts tend to conserve the individual in his emergency, *i.e.*, produce most quickly at the necessary points much blood, rapidly coagulable when shed, and containing that great necessity for muscular activity—blood sugar. Active muscle, be it known, consumes three and a half times as much sugar as resting muscle. At the same time the entire nervous system is alert to direct fight or flight as may be. This fight may be one against other individuals similarly equipped or it may be against other forms of aggression such as germ assault, toxins, acute infections and shock. All such combats require relatively more adrenalin to withstand their assaults and the blood shows an increase of this secretion at these times. Crile proved that injections of colon bacilli, for instance, increased the normal adrenal supply of the blood. Frequently these noxious

agents are so devastating that the adrenal glands are exhausted of their supply and syncope results, with all the phenomena of shock. In emotional excitement, likewise, the sympathetics are involved, liberating through adrenalin, blood sugar. If such excitement is followed by muscular activity, this sugar is consumed, but if not, then frequently it passes out through the kidneys and glycosuria—transient—results. As one author graphically described it, when stocks in Wall Street go down, diabetes goes up! Applied to human individuals, what can we say of the symptoms and physical signs that are produced by reason of a disturbance of the adrenals and the correlated vegetative system? There is a large group of individuals that shows in certain specific examinations many stigmata due to such a mutual disturbance. This group is characterized by small and inadequate adrenals (proved by post-mortem examination in those that succumb) and with this deficiency, hand in hand, we see many of the following signs: (1) small cardiovascular systems; (2) low blood pressures; (3) low blood sugar; (4) long coagulation time of the blood; (5) changes in the composition of the blood, largely, a deficiency of polymorphonuclear leucocytes and an increase in the lymphocytes; (6) deficiency in other tissues such as the pituitary gland which is usually small and frequently largely enclosed; (7) small and undeveloped genitals in both males and females; and many other inadequacies in the tissues of the body. It is the group now designated by the term "status hypoplasticus." The fact that many of these cases show large and persistent thymus glands, large tonsils, Peyer's patches, enlarged spleen and a general hyperplasia of lymphoid tissue led to their original designation as "status thymicolymphaticus." The former, more recent name is perhaps better adapted. By virtue of the deficiencies enumerated, certain symptoms present themselves which make of the victims of this condition inadequate personalities short of actual disease. These symptoms are largely produced because of the lack of the proper stimulation in time of need, of the vegetative nervous system by the inadequate

adrenals. So that "fatigue" after but little exercise whether of mind or of body is pronounced; recovery from fatigue is lengthened because of the difficulty in raising the blood sugar content; the lowered blood pressure likewise inhibits normal activity; the small pituitary and genitals lead to disturbances specific to themselves. As a result of these, added to many minor difficulties in the train of the trouble, the individuals affected feel themselves different from their more fortunate fellows and inferior to them. And so they become rather shy and shut-in, do not mix readily, feel that they cannot meet their daily problems successfully and so try not to meet them at all; are easily led by stronger minds and bodies and become more or less dependent on them. So are produced many habitues of alcohol and drugs, many of the easily led characters among the criminal classes; a large number of psychoneurotics belong to the group and their symptomatology depends largely upon the poor quality of the tissues of the body supplied by the vegetative nervous system under the sway of the adrenals; so that they have cardio-neuroses; gastric neuroses; genital and sexual disturbances; and added thereto, the mental perturbation that accompanies such states. The sympathetic division of the vegetative nervous system is the one that is at fault, for it depends on adrenalin for its emergency activities. Perhaps the parasympathetic therefore, according to the Eppinger and Hess theories, is the one that dominates the picture of deficient adrenal supply and hence the multitudinous symptoms that occur under the designation "vagotonia" more or less fit into the picture. What we have said of the adrenals is presumed to relate to the secretion of the adrenal medulla, although in recent years the cortex, to a large extent, has come into its own. From our small knowledge of the actual active principle or principles involved in suprarenal cortical activity, we cannot at present entirely separate its influence from that exerted by the entire gland. The diminution and gradual atrophy of the suprarenals, probably the cortex as well as the medulla is responsible for the gradual bodily deterioration

and disintegration known as Addison's Disease, with its lowered blood pressure, lowered blood sugar, pigmented areas, rapidly diminishing resistance to fatigue and exertion, gastro-intestinal disturbances and all the diminution in tone of smooth muscle incidental to loss of sympathetic nervous control.

(Here are shown lantern slides of individuals belonging to the group with a history of their difficulties.)

In the domain of the thyroid gland, there is seemingly as little difficulty in associating its disturbances with reciprocal activities of the vegetative nervous system, as is the case with the adrenals. However, if it is true that the cells of the thyroid secreting acini are not anywhere in direct contact with the postganglionic fibres of the sympathetic, as Nonidez has apparently shown, then the matter lies a little differently. The vegetative system can then influence thyroid activity only through the intermediary of the blood vessel control. The thyroid secretion, however, apparently has a direct influence upon the cells or upon the synaptic junctions of the vegetative—probably largely sympathetic—nervous system, lowering their threshold of stimulation. However this may be there is certainly mutual activity—so much so indeed, that once the thyroid is sufficiently aroused, the sympathetics are secondarily stimulated and in their turn via the cervical sympathetic, the thyroid vessels are brought into play and the thyroid secretion increased thereby. This produces a real vicious circle leading gradually to thyroid exhaustion (unless means are taken to break it) and ending in actual myxoedema.

The effect of thyroid activity on the vegetative nervous system is again somewhat in doubt. While there is no doubt whatever that the thyroid secretion is stimulative to the sympathetic division resulting in increased metabolic exchanges, *i.e.*, is katabolic, there is also reason to believe that it has anabolic effects as well. Occasionally one meets with a patient who shows preponderating vagus

effects with thyroid medication rather than sympathetic —but this is against the rule.

The results of excessive thyroid secretion on the organs are manifold. Among the chief ones of course are an increase of all bodily functions, especially those under the sway of the sympathetic. As a result, increased oxidation results with increase in pulse rate, blood pressure, blood sugar, body temperature and a generally increased speed of activity everywhere. This is seen particularly well in the brain and nervous system generally. The patient is speeded up in all nervous reactions, thought is more rapid, action follows judgment more quickly—there is never an idle moment. In early life, in all forms, development is quicker, maturity reached earlier. Thus Gundernatsch caused tadpoles to develop into frogs within three weeks on thyroid feeding, whereas the normal metamorphose takes place in ten to twelve weeks. Many of these results seemingly depend partly upon the thyroid effect on the vegetative nervous system. The symptoms arising from its vagus effects (parasympathetic) are increased peristalsis, increased perspiration and generally an increase in the gastric juice which is of greater than usual acidity. A deficiency of thyroid secretion produces the converse effects: slowing of pulse rate, lowering of temperature, lowered blood sugar and a diminished activity in mental and nervous reactions. Ratiocination becomes sluggish, motion slows down, fatigability and drowsiness are the rule. Initiative is lost. If this occurs in early life then development is retarded. This is true in the mental sphere as well as in the physical. The personality differences between the hyperthyroid and the hypothyroid individuals is at times so great that they are constantly incompatible —one too slow for the other's gait, the other too fiery for the former's lethargy. Many a human combination has been destroyed by this factional difference.

(Here slides are shown illustrative of some of the conditions cited.)

One of my patients showed very interesting thyroid effects with sympathetic concomitants at the slightest emotional stimulation. Whenever in the course of examination she related occurrences that had aggravated her, she would flush, her pulse rate increased rapidly, her thyroid gland visibly enlarged and exophthalmos was produced—all within the space of five minutes. Urine collected shortly afterward frequently showed sugar. Her customary basal metabolic rates were well within normal limits. Many similar cases might be cited.

The third glandular unit in this triple mechanism concerned largely, together with the vegetative system, with the maintenance of normal levels in the organism—or as Cannon terms it *"homeostasis"*—is the pituitary gland. Its importance may be gleaned from its excellently protected position in a skull within a skull. Normally, most investigators are agreed that as a whole it is concerned with several functions in collaboration with the vegetative nervous system. These are the control of growth, regulation of water interchange, stimulation of smooth muscle fibre particularly of the uterus and of the intestine, maintenance of blood pressure and of the sugar content of the blood, and according to some authors, exerting a control of the circulation of the cerebrospinal fluid. The various portions of the gland that specifically exert these influences are the anterior lobe for growth and fat metabolism as well as for sexual stimulation; the posterior for the pressor and oxytocic effects and water and sugar metabolism. It has for its coadjutor in some of these effects the pars intermedia. The matter of water control has recently assumed some importance because of the fact that the French investigators Roussy and Camus had apparently determined that injury to the base of the brain just posterior to the pituitary was specifically the cause of diabetes insipidus, and that theories that were based upon posterior lobe pituitary disturbance as a causal factor did not take cognizance of neighborhood effects, particularly in the region of the corpora mammillaria as the efficient cause. Also that because posterior lobe ex-

tracts—administered hypodermatically—seemed to be specific in their control of the diabetes it did not necessarily follow that injury to the posterior lobe was necessarily the cause. The theory of Roussy and Camus has held more or less sway for the past decade; but quite recently from the Department of Pathology of Chicago University came a case that mathematically demonstrated the fact that, the posterior lobe injury alone, apart from any other lesion, can produce diabetes insipidus. This was a syphilitic gumma that had invaded the *posterior lobe of the pituitary only.* Serial sections of the base posterior to the hypophysis and including the corpora mammillaria showed absolute normality there. The patient's symptoms had been particularly headache of the pituitary character and diabetes insipidus. The fact is probably that there are many links in the chain controlling water exchange in the body of which the corpora mammillaria region is only one. The rationale of the diuresis has been variously explained. Possibly the correct one is that while the posterior lobe extract causes arterial tension in most of the tissues of the body, yet the arterioles of the kidney are dilated by it determining a greater supply of blood to these emunctories. This effect is probably through the vegetative fibres. Pituitary effects according to Cushing and Weed may be produced by stimulation of the fibres of the sympathetic coming from the first three thoracic nerves. These pass via the cervical sympathetic to the carotid plexus and thence to the pituitary. One of the chief effects of such stimulation is the passing of large amounts of urine of low specific gravity. Before the use of pituitrin for diabetes insipidus was common, codeine and similar drugs were used for this purpose. Their effect was probably on the sympathetic, diminishing its effect on the pituitary gland. At this point a seeming paradox may be mentioned, namely, that while stimulation of the posterior lobe produces a diabetes, injections of pituitrin control it! One meets with such paradoxes in medicine occasionally—perhaps too often in the field of endocrine medicine.

The anterior lobe has recently also been given the at-

tribute of increasing the metabolic rate. One case might be cited that contains again a paradox unless explained on this basis. The patient, a woman of forty-five years of age, was sent to the hospital complaining of headache, visual disturbances, great increase of weight, mental hebetude and great depression. Upon examination, the visual fields were proven defective in both temporal halves, she showed a mild papilloedema, her basal metabolic rate was about plus ten (determined in many laboratories) and her pituitary fossa on x-ray examination was found much enlarged, particularly anteriorly, and eroded. Of course an immediate diagnosis of pituitary neoplasm was made. Upon closer examination, however, the patient appeared to look myxoedematous rather than obese, and having come from a goitre region it was then thought possible that part of her difficulty was thyroid in character. Small doses of thyroid were given to her and the change in the entire picture was remarkable. The headaches disappeared, the visual fields became much larger, the papilloedema receded, the myxoedematous appearance disappeared and the strangest one of all the phenomena, the basal metabolic rate diminished to a point somewhat below normal! That is to say, against all rule, thyroid administration apparently diminished basal metabolism. Theoretically it seems probable that because of deficient thyroid activity the pituitary, particularly the anterior lobe, compensated for this deficiency and by enlarging for this purpose brought on the entire pituitary picture and increased the basal metabolic rate to plus ten in spite of thyroid deficiency. When thyroid was finally exhibited, contrary to laboratory indication, the necessity for compensation disappeared, the pituitary resumed its original normal condition, the symptoms thereof vanished and the woman was restored to health. She is quite well to-day with none of the pituitary symptoms or signs remaining excepting the enlarged pituitary fossa, some ten years after the original onset of her trouble. The anterior lobe probably affected the vegetative system as does the thyroid, to increase metabolism. She must constantly, however, take both thyroid

and small amounts of iodine to keep her well. It seems to me that this one case illustrates very well the interrelationship of both thyroid and pituitary anterior lobe with the vegetative nervous system—particularly the sympathetic division, and the autonomic self-regulatory and compensatory possibilities entailed in these mechanisms.

Another important case in this interrelationship between the pituitary, the adrenals and the sympathetic system is the following: A man of some thirty years of age came to the hospital with a pronounced acromegaly—a classical case, as the screen picture shows. His pituitary fossa as you see is enormously enlarged; he did not show a bitemporal hemianopsia, but he had pronounced pituitary headaches and complained, curiously enough, of intense fatigability and general muscular weakness. Delving into his past history, we obtained the knowledge that at about eighteen years of age he had an obscure abdominal condition with diarrhoea, temperature and marked asthenia. There was a history of tuberculosis in the family and his case was denominated at the time, intestinal tuberculosis. Immediately following this, there began to appear on symmetrical areas of his body, pigmented areas, chiefly spinal root areas of the two upper dorsal levels. And within a year, his acromegaly began while a comparative freedom from his weariness and asthenia and abdominal symptoms gradually occurred. This made him moderately comfortable until a few years ago, when his headaches became unbearable and he sought relief. An analysis of his case would, I believe, place it in the category of an original tuberculosis of the adrenals with loss of sympathetic effects, with the asthenia, abdominal symptoms and pigmentations that accompany such a disturbance, gradually improving by virtue of some mechanism which might offset the adrenal symptoms. Such a mechanism is present in the posterior lobe of the pituitary gland—which mobilizes sugar, maintains blood pressure and acts as a stimulant to smooth muscle fibre—but at the cost of a compensatory enlargement. Such enlargement will then, in its turn not

only produce the necessary alleviation of the adrenal symptoms but also in addition its own specific symptoms —acromegaly, enlargement of the pituitary fossa and so on. After having reached a certain level in the acromegalic process, this remained without increase and this patient's treatment with pituitary extract, both by mouth and hypodermatically, helped him extremely.

The cases that show a small and usually markedly enclosed pituitary fossa with many of the evidences of pituitary glandular deficiency, exhibit at the same time many vagotonic or parasympathetic symptoms; low blood pressures, slow pulse, lack of initiative and tendency to drowsiness; and on the psychic level, difficulty in concentration and sustained thinking and a character of rather shut-in type, mark the vegetative disturbances in their combination with functions of the cerebrum. (The screen illustrations mark some of these cases.)

One final glandular unit with whose effects I have had some personal experience, is the parathyroid gland. For many years, ever since the work of McCallum and Voegtlein on calcium metabolism, much has been done in an experimental way with the parathyroids, and yet, only a very few years ago, the *Journal of the American Medical Association* published an account in which the parathyroids were relegated to the far background in their effects, so far as we knew them, on the human organism. We did know that in the old complete thyroidectomies the parathyroids were also removed and tetany universally resulted. In all experimental animals this took place except in some of the *ungulata*. It was supposed that this was because they did not eat meat. But more acute observers, investigating the matter, found that in these *ungulata* the parathyroids were not imbedded in thyroid tissue. but were separately placed. Thyroidectomy did not remove them and hence our first glimpse into their effect on bodily economy was vouchsafed. They had a function which prevented tetanic contractions. Later McCallum and Voegtlein gave us the picture of the rela-

tionship of calcium to muscular sensitiveness and irritability, and of its mobilization to the activity of the parathyroid glands. Since then, Chiari and Froehlich have also demonstrated the hyper-irritability of the entire nervous system in calcium deficiency. Since that time we clinicians have been endeavoring to apply this knowledge to our work. In the past decade we have examined many cases that showed deficiency in blood calcium. The larger number never exhibited entire tetany or other muscular spasmodic phenomena. But they did show other symptoms of a most interesting character. They usually came because of inordinate fatigability, irritability of temper and at times even of incorrigibility, non-amenability to discipline, and assaultiveness; they were easily aroused to a high pitch of anger at the slightest provocation—a word, an insinuation or even a glance being sufficient to arouse intense antagonistic reaction. These patients became problem cases at home, at school or in whatever environment they found themselves, because of their non-adaptability and uncompromising attitude. Occasionally their behavior became so exaggerated that apparently hypomanic states developed therefrom, and several of these patients had to be confined in institutions until the symptoms were ameliorated. At home, a harsh word from any member of the family, at the table for instance, would result in a plate or knife or some other utensil being thrown at the aggressor. In school, a blow, a shout or a curse would be hurled at a fellow student, or even at the teacher. Because these patients seemed to me to have many points in common, such as stature, bodily features and biochemical conditions, it seemed important to determine whether they formed an actual group which could be differentiated by certain stigmas, in both the physical and the biochemical domains. I have collected the reports of a representative group of such cases and have arranged and classified the observations to bring out some of the common correlated features.

Practically all the cases, in both children and adults, showed the physical signs of myotatic irritability and

myoidema, some to a greater degree than others. In some, the myotatic irritability would be increased to such a point that a Chvostek reaction of moderate degree was obtained. The unanimity with which myotatic irritability was found in this entire group of cases is striking. The converse, however, that all patients with myotatic irritability and myoidema have the behavioristic qualities shown by patients in this group is not true to the same extent, but the attributes are nevertheless sufficiently prevalent to awaken suspicions of conduct disorders whenever these physical signs are evoked. The best site for eliciting both myotatic irritability and myoidema is at the shoulder over the deltoid and pectoral muscles.

Because of the correlation between muscle irritability and non-utilization of calcium, I next undertook the examination of the calcium content of the blood. In our laboratory examination, the calcium content of the whole blood is determined—not merely that of the serum. The normal values are from 6.5 to 9.5 mg. per hundred cubic centimetres of whole blood. From the tables it will be seen that nineteen of twenty-three cases showed deficient blood calcium, varying from 5 to 8 mg. per hundred cubic centimetres. The four cases that showed an apparently normal blood calcium are of interest for the reason that treatment was just as efficient in them as in the other nineteen cases that showed deficient blood calcium. This led me to suppose that it was not so much the presence of calcium in the blood that determines the disturbances as it was the *utilization* of calcium which under treatment seemed generally to be increased. It is curious to note that in many of the cases in which a low calcium content was observed in the blood, there was an increased deposit of calcium in various portions of the body producing thick skull tables, and particularly that there were calcium deposits in the pineal gland.

It is interesting to note that of nineteen cases in which the skull was examined with the X-ray, fourteen showed a pineal shadow in spite of the fact that the patients in all

were sixteen years of age or less—a comparatively rare observation. Whether the pineal calcification is merely a part of the calcium metabolic disturbance in the patient or whether it represents a pineal involutional process is difficult to say. If it represents a pineal involutional process, one would expect to find some structural or metabolic effect. As a matter of fact, in five of my cases in which a pineal shadow was shown, there were such symptoms as enlarged clitoris and breasts (one case) pubertas praecox (one case) and enlarged genitals in boys (three cases). In several others, psychosexual precocity was pronounced. Whether or not the pineal effect on muscular activity, as has been said, is a fact, it is interesting to note that a large percentage of my cases showed intense muscular fatigability in spite of an increased blood sugar and increased blood pressure.

The next interesting observation in these cases pertains to growth in length. Of nineteen cases, six of the children were of normal height, four were between 2 and 4 inches (5.08 and 10.16 cm.) below average height for age, and nine were 4 inches (10.16 cm.) or more below the average height for age; these figures show a tendency toward dwarfism. When one realizes that the utilization of calcium is deficient, one can readily understand how part of non-utilization might readily have affected the growth of the long bones.

Running in inverse proportion to the calcium is the sugar content of the blood. Only two of my patients had a sugar content below 100 mg. per cubic centimetre; the blood sugar of twelve being between 110 and 140 and this occurred in subjects under sixteen years of age. A low calcium content in combination with a high content of sugar in the blood has been noted by some observers in some types of diabetes, although in none of my patients was glycosuria present.

Although the patients whose cases are here used as illustrations were sixteen years of age or under, fourteen of seventeen had a blood pressure above 100, ten above 110

and five about 120; one girl, eleven years of age, had a systolic pressure of 140. The high content of sugar in the blood and the high blood pressures are possibly secondary to sympathetic disturbance, involving perhaps also the suprarenal or the pituitary glands. Indeed, with the rather high sugar mobilization, both suprarenal and pituitary glands in relation to the sympathetic might well be considered in connection with the comparatively high tension.

All of the cases were classified on the one basis of behavioristic qualities. As already stated, these varied from the simply incorrigible and quarrelsome ones to those performing assaultiveness and exhibiting the most violent temper, reaching the point of hypomanic disturbance. Whether these behavioristic qualities are due to defect in the utilization of calcium or to some other factors that have been discussed, is a moot point. It seems to me, however, not only because the low utilization of calcium is the most constant factor, but also because of the effect of non-utilization of calcium on the muscular system, that the behavioristic anomalies may belong to the same category, depending on the non-utilization of calcium by the vegetative nervous system. It has been shown by a number of previous investigators that diminution in the supply of calcium to the blood results in increased reaction of nerve tissue to an induction current. It is possible that the same factors that bring about myotatic irritability in the muscle, also bring about untoward reactions in the nervous system. That is to say, reaction follows stimulus so rapidly that the overt act is committed before reason and judgment can come into play for purposes of inhibition.

This speed of nerve reaction is perhaps also the basis for the wit and precocity shown by these persons—a property which they all possess.

For the most part, not only are these patients remarkably witty and precocious in replies and reactions, but they are, in the main, intelligent as well. Theirs is not the

incorrigibility and bad-temperedness of the moron and the defective, for on psychometric test in all of my cases only one subject showed an intelligence below normal. Indeed, in school these children were among the brightest and highest in scholastic standing.

The high blood sugar values, the assaultiveness, the speed of reaction time, the high blood pressures, all point to a sympathetic activity above the normal. That is to say, absence or rather diminution of parathyroid activity is consonant with increased sympathetic tone; normal parathyroid secretion corrects this and is therefore probably among the vagotonic group or parasympathetic stimulants. This curious juxtaposition of thyroid and parthyroid anatomically, with reverse effects on the vegetative nervous system is frequently met with in the glandular system—witness the cortex and medulla of the suprarenals and the anterior and posterior lobes of the pituitary.

With these examples presented to you of the intricate correlations between some of the glandular elements and the division of the vegetative nervous system and the disease pictures produced by their disturbances, I trust that my function this evening has been of sufficient interest to you to stimulate further research and inquiry into the past histories of those of your patients whose complaints have only partially been understood and evaluated, with the purpose of determining a kinetic rather than a static viewpoint of the causation of many human ills.

LEGAL STATUS OF HOSPITAL RECORDS

The Neurological Institute asked the opinion of the Academy on the status of hospital records. A series of questions were formulated by the Neurological Institute and in view of its wider experience the questions were forwarded to the American Medical Association.

The questions and the answers of the Bureau of Legal Medicine and Legislation of the American Medical Association are as follows:*

1. *How much of the clinical record on ward patients is subject to subpoena by the courts?* Answer.—I know of no basis for drawing a distinction between the right of the courts to subpoena the clinical records of ward patients and the right of the courts to subpoena clinical records of private patients. The record of either class may be subpoenaed so far as such records are material and pertinent to the issues before the court. Probably this is true with respect even to records covered by the statutes forbidding the introduction of privileged communications in evidence, even though such records *could not be admitted in evidence after they had been produced in court in response to the subpoena.* In any event, it would be unwise for an officer of a hospital served with a subpoena commanding him to produce the records in any case to decline to respond to that subpoena and to produce the records, unless he was willing to assume the burden of determining whether such records were or were not admissible and contesting the issue, if he should be adjudged in contempt, by habeas corpus proceedings and appeals to the higher courts. The proper course, in such a case, it seems to me, would be to produce the records and leave the judge to determine whether they are or are not admissible.

2. *Are any of the records contained in the chart of the patient considered as given in confidence, and is such confidence protected by the courts?* Answer.—It may be stated as a general rule that where the information recorded on a chart represents a privileged communication between the physician and the patient, within the meaning of the statute governing privileged communications in the jurisdiction where the question arises, and if the patient has not expressly or by implication waived his privilege of secrecy, the record will to that extent be regarded as privileged.

3. *Are the records of private patients considered to be the property of the private physician taking care of them in the hospital, or are the records considered to be the property of the hospital?* Answer.—So far as I know, no court has passed on the ownership of the clinical records of hospital patients, either of private patients or of any other class. The matter of ownership might be governed by express agreement in any particular case,

---

* Published with permission of the American Medical Association.

provided the agreement was entered into before the patient entered the hospital. In the absence of an express agreement it is presumably governed by the rules of the hospital; a patient entering a hospital and a physician undertaking to treat a patient in a hospital may be presumed to agree to abide by such rules when they enter the hospital premises. In the absence of an express agreement and of hospital rules, the courts would probably follow the established universal or near-universal custom with respect to the matter. That custom would, it seems to me, constitute the hospital as owner of such records *as trustees for the benefit of the patient.* I am by no means sure that the attending physician has any right in the records after he has discontinued attendance on the patient, unless there is some express agreement giving him that right.

4. *What parts of these records are considered to be given in confidence and therefore not subject to legal review or to be used in evidence?* Answer. —Just what is intended by the phrase "legal review or to be used in evidence," is not clear. The extent to which the recorded data are protected from disclosure in court depends on the law governing privileged communications in the jurisdiction where an effort is being made to compel such disclosure.

This, of course, is a question somewhat different from the use of hospital records in evidence, a matter that involves questions of hearsay, authentication, etc., that can hardly be discussed satisfactorily within the compass of a letter.

5. *Are x-ray films taken of private patients considered to be a part of the hospital record, or are they the property of the private patients?* Answer.—Roentgenograms of hospital patients taken in the course of diagnosis and treatment in the hospital are, in my judgment, a part of the hospital records, and I can see no reason for regarding them in any other way, although I know of no court decision of any court of appellate jurisdiction bearing on this point. With respect to the ownership of such records, whether taken in a hospital or elsewhere, your attention is invited to an article in the *Journal of the American Medical Association, June* 18, 1927, 88: 1985-1986.

RECENT ACCESSIONS TO THE LIBRARY

Achard, C. Les maladies typhoïdes.
Paris, Masson, 1929, 305 p.

Alkan, L. Anatomische Organkrankheiten aus seelischer Ursache.
Stuttgart, Hippokrates-Verlag, 1930 [1929], 142 p.

Appelt, A. Stammering and its permanent cure.
[3. ed.], London, Methuen, [1929], 227 p.

Babaiantz, L. La granulomatose maligne.
Lausanne, Payot, 1928, 175 p.

Barbara, M. La costituzione degli eredotubercolosi.
Bologna, Cappelli, 1929, 318 p.

Bartels, H. A. Outline of bacteriology.
N. Y., Broder, [1929], 128 p.

Bass, C. C. & Johns, F. M. Practical clinical laboratory diagnosis.
3. ed., London, Baillière, 1929, 187 p.

Bentley, A. O. A text book of pharmacy.
2. ed., London, Baillière, 1929, 631 p.

Bériel, L. & Mestrallet, A. Les compressions médullaires.
Paris, Baillière, 1929, 193 p.

Bernfeld, S. The psychology of the infant.
London, Paul, 1929, 309 p.

Bouin, P. Eléments d'histologie.
Paris, Alcan, 1929, v. 1.

Boveri, T. The origin of malignant tumors.
London, Baillière, 1929, 119 p.

Bullock, F. The law relating to medical, dental, and veterinary practice.
London, Baillière, 1929, 317 p.

Burnier, M. H. Habitual constipation and its treatment.
London, Baillière, 1929, 71 p.

Burrell, L. S. T. Recent advances in pulmonary tuberculosis.
London, Churchill, 1929, 217 p.

California state dietetic association. Compilation of diets.
Gardena, Spanish-American Institute Press, 1929, 77 ff.

Chabanier, H.; Lebert, M. & Lobo-Onell, C. Physiopathologie et traitement du diabète sucré.
Paris, Masson, 1929, 441 p.

Cherry, T. H. Surgical and medical gynecologic technic.
Phila., Davis, 1929, 678 p.

Chesterman, C. C. African dispensary book.
London, Christian Lit. Soc., 1929, 276 p.

Collins, E. T. The history and traditions of the Moorfields eye hospital.
London, Lewis, 1929, 226 p.

Combes, R. La vie de la cellule végétale.
Paris, Colin, 1927-29, 2 v.

Dalla Volta, A. & Patrizi, C. Linfogranulomatosi maligna.
Milano, Vallardi, 1929, 320 p.

Defarge, A. Historie critique des anesthésiques anciens.
Bordeaux, Bière, 1928, 289 p.

Deutschländer, C. Orthopädisches Schulturnen.
2. Aufl., Leipzig, Verband der Ærzte Deutschlands 1929, 332 p.

Dognon, A. Précis de physico-chimie biologique et médicale.
Paris, Masson, 1929, 310 p.

Douthwaite, A. H. The treatment of rheumatoid arthritis.
London, Lewis, 1929, 80 p.

Ducuing, J. Phlébites thromboses et embolies post-operatoires.
Paris, Masson, 1929, 478 p.

Dufourmentel, L. Chirurgie de l'articulation temporo-maxillaire.
Paris, Masson, 1929, 228 p.

Dujarric de la Rivière, R. Etiologie et prophylaxie de la grippe.
Paris, Masson, 1929, 105 p.

Ewing, H. E. A manual of external parasites.
London, Baillière, 1929, 225 p.

Facchini, V. La sierodiagnosi della sifilide.
Bologna, Cappelli, 1929, v. 1.

Frostig, J. Das Schizophrene Denken.
Leipzig, Thieme, 1929, 87 p.

Gastin, L. Le droit de guérir.
Paris, Penser et Agir, 1929, 139 p.

Gillespie, R. D. Hypochondria.
London, Paul, 1929, 104 p.

Goodman, H. Sanitation, hygiene, bacteriology and sterilization.
N. Y., Medical lay press, 1929, 151 p.

Gutmann, M. J. Die Pollenallergie.
München, Gmelin, 1929, 145 p.

Hammer, W. Geschichte der Erkennung und Heilung von Geistes- und Seelenkrankheiten bei Tieren.
2. Aufl., Berlin, Madaus, 1928, 214 p.

Handwörterbuch der gesamten Zahnheilkunde.
Leipzig, Barth, 1929, v. 1.

Hauduroy, P. Les ultravirus et les formes filtrantes des microbes.
Paris, Masson, 1929, 392 p.

Häupl, K. & Reichborn, Kjennerud, I. Moderne zahnärztliche Kronen- und Brückenarbeiten.
Berlin, Meusser, 1929, 232 p.

Hertslet, L. E. Skin; its uses in six phases.
London, Churchill, 1929, 206 p.

Herz, R. Die photographischen Grundlagen des Röntgenbildes.
Leipzig, Thieme, 1929, 225 p.

Hess, A. F. Rickets, including osteomalacia and tetany.
Phila., Lea, 1929, 485 p.

Hewer, E. E. & Sandes, G. M. An introduction to the study of the nervous system.
London, Heinemann, 1929, 104 p.

Hickel, R. Réactions, incidents, accidents, provoqués par les rayons ultra-violets.
Paris, Legrand, 1929, 128 p.

Higgins, H. Biological reversion and Hippocratic anatomy.
London, Lewis, 1929, 149 p.

Hurst, A. F. & Stewart, M. J. Gastric and duodenal ulcer.
London, Milford, 1929, 544 p.

Jeffery, C. Rheumatism; its prevention and cure.
London, Mills, [1929], 190 p.

Jellett, H. The causes and prevention of maternal mortality.
London, Churchill, 1929, 300 p.

Jumon, H. L'auscultation pulmonaire moderne.
Paris, Maloine, 1929, 217 p.

Kaplan, L. Grundzüge der Psychoanalyse.
2. Aufl., Baden-Baden, Merlin, 1929, 397 p.

Kidd, F. & Simpson, A. M. Common infections of the female urethra and cervix.
[2. ed.], London, Milford, 1929, 197 p.

Klare, K. & Knüsli. Röntgenatlas der Lungentuberkulose des Kindesalters.
2. Aufl., Leipzig, Kabitzsch, 1929, 115 p.

Kleinschrod, F. Kneippkur und Heublumenkur.
4. Aufl., Donauwörth, Auer, [1929], 236 p.

Koch, F. Ursprung und Verbreitung des Menschengeschlechts.
Jena, Fischer, 1929, 174 p.

Kromayer, E. Die Behandlung der kosmetischen Hautleiden.
Leipzig, Thieme, 1929, 124 p.

Künkel, F. Die Arbeit am Charakter.
2. Aufl., Schwerin, Bahn, 1929, 163 p.

Kunze, G. Parazelsus und die Reform der medizinischen Wissenschaft.
Berlin, Selbstverlag, 1929, 129 p.

Labbé, M. & Stévenin, H. Le métabolisme basal.
Paris, Masson, 1929, 343 p.

Levine, S. A. Coronary thrombosis.
Baltimore, Williams, 1929, 178 p.

Llopis, F. Hämophilie und ihre Behandlung.
Leipzig, Bart, 1929, 95 p.

Lumière, A. Le cancer, maladie des cicatrices.
Paris, Masson, 1929, 287 p.

Lund, J. K. Diabetics; a manual for persons suffering from diabetes mellitus.
London, Faber, 1929, 87 p.

Lund, L. Pathologisch-anatomische Diagnostik an Tierleichen.
Hannover, Schaper, 1929, 303 p.

Mackenzie, J. Army health in India.
London, Bale, 1929, 158 p.

Mangiagalli, L. Lezioni de ostetricia e di clinica ostetrica.
Milano, Soc. An. 1st. Ed. Scientif., 1928-29, 3v. in 4.

Marie, A. La réforme de l'assistance aux aliénés.
Paris, Edition Medicales, 1928, 114 p.

Marsh, J. E. The origins and the growth of chemical science.
London, Murray, [1929], 161 p.

Martin-Sans, E. L'empoisonnement par les champignons.
Paris, Lechevalier, 1929, 251 p.

Mayneford, W. V. The physics of x-ray therapy.
London, Churchill, 1929, 177 p.

Monceaux, R. Troubles des échanges nutritifs dans la tuberculose pulmonaire.
Saint-Cloud, Girault, 1929, 446 p.

Negus, V. E. The mechanism of the larynx.
London, Heinemann, 1929, 528 p.

Nicolas, E. Ophthalmologie vétérinaire et comparée.
2. éd., Paris, Vigot, 1928, 499 p.

Nord, F. F. Mechanism of enzyme action.
London, Baillière, 1929, 78 p.

Ogden, C. K. The A. B. C. of psychology.
London, Paul, 1929, 279 p.

Ogilvie, W. H. Recent advances in surgery.
2. ed., London, Churchill, 1929, 495 p.

Onslow, M. W. Practical plant biochemistry.
Cambridge, Univ. Press., 1929, 206 p.

Parkes, A. S. The internal secretions of the ovary.
London, Longmans, 1929, 242 p.

Parmelee, M. Nudity in modern life.
London, Douglas, 1929, 303 p.

Parturier, G. Conférences d'hépatologie.
Paris, Vigot, 1929, 260 p.

Paterson, H. J. Indigestion.
London, Heinemann, 1929, 153 p.

Patton, W. S. & Evans, A. M. Insects, ticks, mites, and venomous animals of medical and veterinary importance.
Croydon, Grubb, 1929, 785 p.

Piéron, H. Psychologie expérimentale.
Paris, Colin, 1927, 220 p.

Popenoe, P. The child's heredity.
Baltimore, Williams, 1929, 316 p.

Porges, O. Magenkrankheiten; ihre Diagnose und Therapie.
Berlin, Urban, 1929, 179 p.

Port-Euler Lehrbuch der Zahnheilkunde.
4. Aufl., München, Bergmann, 1929, 727 p.

Ramsay, A. M. The eye in general medicine.
London, Baillière, 1929, 255 p.

Rank, O. The trauma of birth.
London, Paul, 1929, 224 p.

Reese, J. R. The health of the mind.
London, Faber, [1929], 266 p.

Richet, C. jr. Précis de pathologie expérimentale.
Paris, Baillière, 1929, 331 p.

Rist, E. Qu'est-ce que la médecine?
Paris, Masson, 1929, 235 p.

Rowntree, L. G. & Brown, G. E. The volume of the blood and plasma in health and disease.
Phila., Saunders, 1929, 219 p.

Santenoise, D. Pneumogastrique, appareil thyroïdien et activité cérébrale.
Paris, Legrand, 1929, 336 p.

Saupe, E. & Ehle, K. Das Thoraxröntgenbild des normalen Säuglings.
München, Lehmann, 1929, 41 p.

Schröder, H. Uber die Aufgaben der zähnarztelichen Prothetik.
Berlin, Meusser, 1929, 150 p.

Schroff, J. Fundamentals of pathology.
N. Y., Broder, [1929], 109 p.

Smith, C. S. & Wikoff, H. L. Practical materia medica.
Phila., Lea, 1929, 300 p.

Somerville, H. Madness in Shakespearian tragedy.
London, Richards, [1929], 207 p.

Synopsis of the practice of preventive medicine as applied...at Harvard Medical School.
Cambridge, Harvard Univ. Press, 1929, 194 p.

Terrien, F. Sémiologie oculaire, statistique et dynamique oculaires.
Paris, Masson, 1928, 224 p.

Thannhauser, S. J. Lehrbuch des Stoffwechsels und der Stoffwechselskrankheiten.
München, Bergmann, 1929, 741 p.

Thiel, P. J. Die Augendiagnose.
2. Aufl., Leipzig, Krüger, 1929, 380 p.

Tholuck, H. J. Die Behandlung der Milchzahne.
Berlin, Meusser, 1929, 108 p.

Tobías, J. W. Tumores primitivos de la pleura.
Buenos Aires, El Ateneo, 1928, 479 p.

Tredgold, A. F. Mental deficiency.
5. ed., London, Baillière, 1929, 535 p.

Unfall-Neurose (Die) als Problem der Gegenwartsmedizin. Hrsg. von Walther Riese.
Stuttgart, Hippokrates-Verlag, 1929, 261 p.

de Varigny, H. Mort véritable et fausse mort.
Paris, Alcan, [1929], 318 p.

Voivenel, P. & Lagriffe, L. Sous le signe de la P. G.
5. éd., Paris, Renaissance du Livre, 1929, 256 p.

Volhard, F. & Becher, E. Die klinischen Methoden der Nierenfunktionsprüfung.
Berlin, Urban, 1929, 308 p.

Walkhoff, O. Die Vitamine in ihrer Bedeutung für die Entwicklung... der Zähne gegen Erkrankungen.
Berlin, Meusser, 1929, 100 p.

White, H. P. W. Stone in the urinary tract.
London, Churchill, 1929, 344 p.

Wolff, L. Keats.
3. ed., Paris, Bloud, 1929, 330 p.

AMONG OUR MANUSCRIPTS

Associations of David Hosack

This age of rush and hurry has eliminated much uninteresting but necessary labor on the part of the doctor as well as the business man. It seems incredible that only a hundred or so years ago the physician had to pause in the practice of his profession for the more simple task of writing out all his letters and lectures. But it is this fact alone that has given us many interesting documents, and we harbor no envy toward those of the future who must work on the impersonal typewritten sheets that are the manuscripts of today.

The name of David Hosack is familiar to all who have dipped into the medical history of this country. It is fitting that a library situated in the city where he was born, where he practiced and where he taught for so many years should be in possession of so much that has come from his hand, so much that cannot be duplicated. Through the kindness of a Fellow of the Academy, Dr. Alfred M. Hellman, this library has upon its shelves several manuscripts written by Dr. Hosack, his lectures on botany, on materia medica, two memorandum books, and a "List of private pupils educated in the office of D Hosack from the year 1795." The latter is prefaced by a copy of the "Regulations to be observed by the private pupils of medecine [*sic*] in the office of David Hosack," to which the names of the students are subscribed. The rules are as follows:

1) The Hours of attendance to be from 9 A.M. to 9 P.M. excepting the time of meals and attendance upon Lectures or the Hospital.

2) No gentleman will leave the city or absent himself from the office to go into the country without previously consulting his instructor excepting during the vacation in the month of August.

3) The duties of the office viz preparing the medecines prescribed, keeping a Register of the weather to be done in rotation.

4) No conversation to be held upon any other than medical subjects or such as are connected with medicine.

5) No Books to be read in the office but such as relate to medecine and its collateral branches.

6) No *Tobacco* or *Spiritous liquors* to be made use of in the office.

His lectures were written about 1804 when he was professor of materia medica at Columbia. His memorandum books cover a longer period of time. The earlier one, started in 1795, contains his accounts. The other, dating from about 1811, consists of notations on medical subjects, which he jotted down whenever he found something he felt of unusual interest. These continue up to the year of his death, 1835.

From another source has come a manuscript, not written by Dr. Hosack, but full of interesting and personal material. This is a well thumbed folio in which his letters have been copied, perhaps by some of his students, perhaps by members of his family, sometimes dashed off in a most undecipherable hand, sometimes painstakingly entered by a firm round hand, and occasionally corrected in the hand of Dr. Hosack. The greater part of the correspondence is on the subject of yellow fever. It was at this time that he was editing the *Medical and Philosophical Register*, and many letters were sent to doctors in this country, the West Indies, and other places which had witnessed the ravages of fever epidemics, in order that their opinions might be included in the material for this publication. These letters were sent to such men as Samuel Bard, William Currie, Colin Chisholm, Timothy Dwight and Noah Webster. The Elgin Botanic Garden which he had founded, formed the subject of a number of other letters. Dr. Hosack, desiring to make a disposal of this property to the State, found that "a vile attempt has been made by

Dr. [Nickolaus] Romeyne to defeat my application." It was six months before he could overcome this opposition. From one letter we find that it is to Dr. Hosack that we are indebted for Sully's familiar portrait of Dr. Benjamin Rush, sitting at his desk, his glasses pushed well back on his forehead, his right hand resting on an open book. Dr. Hosack wrote to Sully, asking him to paint the portrait, in April, 1812, just a year before Dr. Rush's death. The painting was soon begun, but evidently the artist did not agree with Dr. Hosack that it would be improved by "throwing into the background a distant view of your city [Philadelphia] Hospital or University to which Dr. Rush's labours have been so much devoted." Later, however, engraved copies appeared in which Dr. Hosack's advice has been taken, for we find in some of these that the background of his study has been ignored by the engraver who has substituted the "distant view" of the Pennsylvania Hospital. How Sully felt about it was another matter. A few months after Dr. Rush's death Hosack wrote to his son, Richard Rush, that he would send him "by the first private conveyance a proof impression of an engraving made from the original portrait in my possession—that done in Philadelphia is by no means well done—Sully is mortified at it after seeing mine." Another letter of interest is that addressed to Dr. Alyre Raffeneau Delile, April 9, 1808, describing the operation for which Dr. Hosack is so well known, that of tying the femoral artery for aneurism. The operation was performed just nine days before this was written. The many letters of introduction which we find in this volume indicate the varied extent of his friends on both sides of the water: Washington Irving, Benjamin Smith Barton, Wright Post, on this side; John Bostock, Sir James Edward Smith, John Coakley Lettsom and others of England. Then, too, we find among his patients many people of note. It is interesting to see that Dr. Hosack, the surgeon who was in attendance at the Burr-Hamilton duel, kept up his friendship with the Burr family, for in 1808 we find him writing most cordial letters to Joseph Alston and his wife, Theodosia

Burr. There are over a hundred letters in all, few of which are directed to any but well known and important people. We are grateful indeed for such a glimpse into the life of this active and much respected gentleman.

GERTRUDE L. ANNAN.

PROCEEDINGS OF ACADEMY MEETINGS

DECEMBER

STATED MEETINGS

Thursday Evening, December 5, at 8:30 o'clock

Program presented in cooperation with the Sections of Surgery and Medicine.

ORDER

I. EXECUTIVE SESSION
   a. Election of officers
   b. Vote on proposed amendments to Constitution and By-laws
   c. Supplementary report of Nominating Committee
   d. Nomination of Honorary Fellows
   e. Election of Fellows

II. PAPERS OF THE EVENING
   a. The treatment of peptic ulcer, Thomas R. Brown, Baltimore (by invitation)
   b. Ulcers of the duodenum and stomach, Frank Lahey, Boston (by invitation)

III. DISCUSSION
   Dudley Roberts, Mills Sturtevant, Hermann Fischer, Fordyce B. St. John

Thursday Evening, December 19, at 8:30 o'clock

THE THIRD HARVEY LECTURE

Some phases of the filterable virus problem, Ernest W. Goodpasture, Professor of Pathology, Vanderbilt University School of Medicine.

G. CANBY ROBINSON, President Harvey Society

DAYTON J. EDWARDS, Secretary Harvey Society

This lecture takes the place of the second Stated Meeting of the Academy for December.

Section Meetings

Section of Dermatology and Syphilology

Tuesday Evening, December 3, at 7:45 o'clock

ORDER

I. Presentation of Patients
   a. Cases from the Mt. Sinai Hospital
   b. Cases from the Good Samaritan Dispensary

II. Miscellaneous Cases

III. Discussion of Cases

IV. Executive Session

Note: Examination of cases is limited to members and their invited guests

Section of Neurology and Psychiatry

Monday Evening, December 9, at 8:30 o'clock

(Please note change in date)

ORDER

I. Reading of the Minutes

II. Papers of the Evening
   a. Narcolepsy associated with chronic encephalitis, Walter Bromberg (by invitation)
   b. A discussion of some errors in the diagnosis of schizophrenia, C. Macfie Campbell (by invitation)

   Discussion, Henri Claude, Paris (by invitation), Ernst Kretschmer, Marburg (by invitation), David K. Henderson, Glasgow (by invitation), Walther Spielmeyer, Munich (by invitation), Constantin von Economo, Vienna (by invitation)

   c. Some observations on recent advances in psychiatry with special reference to schizophrenia, Eugen Bleuler, Zurich, Switzerland (by invitation)

   Discussion, Henri Claude, Paris (by invitation), Ernst Kretschmer, Marburg (by invitation), David K. Henderson, Glasgow (by invitation), Walther Spielmeyer, Munich (by invitation), Constantin von Economo, Vienna (by invitation)

III. General Discussion

IV. Executive Session

Section of Pediatrics

Thursday Evening, December 12, at 8:30 o'clock

ORDER

I. Papers of the Evening
   a. Blood volume studies in dehydration, Rustin McIntosh, Baltimore
   b. Cause of the acidosis associated with diarrhoea, L. Emmett Holt, jr., Baltimore (by invitation)

c. Treatment of anemia in infancy, Hugh Josephs, Baltimore (by invitation)

d. Changes in serum electrolytes in rickets, Bengt Hamilton, Baltimore (by invitation)

e. Earliest anatomical change in rickets, Edwards A. Park, Baltimore (by invitation)

Discussion, Oscar M. Schloss, Martha Wollstein, Benjamin Kramer, Alwin M. Pappenheimer

SECTION OF OTOLOGY

Friday Evening, December 13, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PRESENTATION OF SPECIMENS

III. CASE REPORTS

IV. PAPERS OF THE EVENING

a. The physiology and clinical examination of the labyrinth. Lantern slides, J. D. Whitham (by invitation)

b. The clinical pathology of mastoiditis with special reference to bacteriemia and blood transfusions, A. A. Eggston

V. GENERAL DISCUSSION

VI. EXECUTIVE SESSION

SECTION OF OPHTHALMOLOGY

Monday Evening, December 16, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PRESENTATILON OF CASES

III. DEMONSTRATIONS

a. 1. Implantation cysts

2. Myopic crescents with associated choriovaginal veins (lantern slides), Louise H. Meeker (by invitation)

b. Aids to ophthalmoscopy, Algernon B. Reese

IV. PAPERS OF THE EVENING

a. Ocular movements, Cornelis D. Verrijp, Leyden, Holland (by invitation)

b. The vision of preschool children. An analytical study of 982 children by the National Society for the Prevention of Blindness (lantern slides) B. Franklin Royer (by invitation)

V. GENERAL DISCUSSION

VI. EXECUTIVE SESSION

SECTION OF GENITO-URINARY SURGERY

Wednesday Evening, December 18, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PRESENTATION BY POST-GRADUATE HOSPITAL UROLOGICAL STAFF

a. An interesting case of renal tumor, J. Sidney Ritter

b. A clinico-anatomical study of the vesical neck, Joseph A. Hyams, Samuel E. Kramer (by invitation)

c. Factors influencing motility of spermatozoa in semen, C. Travers Stepita, John A. Killian, Ph.D. (by invitation)

d. Solitary cyst of kidney with resection, George F. Cahill

e. Vesical neck obstruction with large vesical calculus. Bilateral hydroureters with hydronephrosis, double left kidney and ureter, Clarence G. Bandler, Joseph A. Hyams

f. Functional end results in renal injury, Stanley R. Woodruff

g. Hemi-nephrectomy in pyonephrotic horseshoe kidney, Joseph F. McCarthy

III. GENERAL DISCUSSION

SECTION OF ORTHOPEDIC SURGERY

Friday Evening, December 20, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PAPER OF THE EVENING

Contractions of the hand, Sumner L. Koch, Chacigo (by invitation)

Discussion to be opened by Hugh Auchincloss

III. EXECUTIVE SESSION

SECTION OF LARYNGOLOGY AND RHINOLOGY

Friday Evening, December 20, at 8:30 o'clock

(Please note change in date and time)

ORDER

I. READING OF THE MINUTES

II. PAPERS OF THE EVENING

Subject: Vaso-motor disturbances in rhinology

a. Allergy in rhinology, Robert A. Cooke

Discussion, Alexander C. Howe

b. Relation of sinus disease to vaso-motor disturbances, Lee M. Hurd

c. Diagnosis of vaso-motor disturbances of the nose, Louis Hubert

III. GENERAL DISCUSSION

IV. EXECUTIVE SESSION

SECTION OF OBSTETRICS AND GYNECOLOGY

Thursday Evening, December 26, at 8:30 o'clock
(Please note change in date)

ORDER

I. READING OF THE MINUTES
II. PAPER OF THE EVENING
Laparo-trachelotomy
A motion picture in 8 reels with movietone, Joseph B. DeLee, Chicago (by invitation), Edwin G. Langrock introduced M. Edward Davis, Chicago (by invitation)
Discussion, Frederick C. Holden, I. C. Rubin
III. GENERAL DISCUSSION
IV. EXECUTIVE SESSION

NEW YORK MEETING OF THE
SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE
under the auspices of
THE NEW YORK ACADEMY OF MEDICINE
Wednesday Evening, December 18, at 8:15 o'clock

I. Utilization of fat by resting and exercising muscles of diabetic dogs, H. E. Himwich, H. Friedman, E. Berry, W. H. Chambers
II. The so-called hyperglycemic action of insulin, I. Neuwirth, F. CoTui, G. B. Wallace
III. Influence of acid and base-forming feeding on growth, E. L. Samuel, I. N. Kugelmass
IV. Effect of division of dorsal roots of cervical nerves upon diaphragmatic respiratory movements, H. C. Coombs
V. A method for determining the chill producing properties of anti-pneumococci serum, A. B. Sabin, G. B. Wallace

NEW YORK PATHOLOGICAL SOCIETY
in affiliation with
THE NEW YORK ACADEMY OF MEDICINE
Monday Evening, December 23, at 8:30 o'clock
(Please note change in date)

ORDER

I. PAPERS OF THE EVENING
a. Adeno-fibro-sarcoma of the breast, Lawrence Sophian (by invitation)
b. Cellular fibroma of the pleura, Angelo M. Sala
c. Aneurysm of the bronchial artery, Angelo M. Sala, Mendel Jacobi
d. Aneurysm of aorta rupturing into superior vena cava, Lawrence H. Cotter
e. Anomalous ramifications of the coronary artery, William A. Antopol, M. A. Kugel
f. A case of Schilder's encephalitis, L. W. Smith, I. Scheffer (by invitation)
II. EXECUTIVE SESSION

HONORARY FELLOWS ELECTED JANUARY 2, 1930

Russell Henry Chittenden..Emeritus Professor of Physiological Chemistry Yale University

Jules Bordet....Professor of Bacteriology, Parasitology and Epidemiology Brussels University

Sir Thomas Lewis.....Physician, University College Hospital, London

Ernst Fuchs....Emeritus Professor of Ophthalmology, University of Vienna

Sir Frederick Gowland Hopkins.....Professor of Biochemistry University of Cambridge

Madame Marie Curie.....Director of Laboratory of General Physics and Radioactivity, Radium Institute, Paris

René Leriche.....Professor of Clinical Surgery, Faculty of Medicine University of Strassbourg

FELLOWS ELECTED JANUARY 2, 1930

Richard M. Brickner.....123 West 74th Street

Thomas Wood Clarke.....7 Cottage Pl., Utica, N. Y.

Charles Davison.....Montefiore Hospital

Botho F. Felden.....216 West 89th Street

Robert Cockburn Fisher, 2nd.....243 East 36th Street

Harry Gold.....2387 Creston Avenue

James Francis Grattan.....30 West 59th Street

Martin Lewis Janes.....330 West 72nd Street

Scott Johnson.....59 East 77th Street

S. Edward King.....105 East 63rd Street

Meyer J. Kutisker.....152 East 35th Street

Peter Lavalle.....241 West 4th Street

Morris Leff.....15 East 111th Street

Hubert A. Lyons.....32 East 65th Street

David A. Newman.....1325 Grand Concourse

Harry Allen Durfee O'Connor.....216 East 50th Street

Walter L. Pannell.....25 Prospect Street, East Orange, N. J.

Jean Harwood Pattison.....120 East 75th Street

David Perla.....Montefiore Hospital

Edward C. Reifenstein.....713 East Genesee Street, Syracuse, N. Y.

Lawrence Weld Smith.....477 First Avenue

Albert Mason Stevens.....55 East 76th Street

Harold Julian Stewart.....Rockefeller Institute

Spencer Goldsmith Strauss.....912 Fifth Avenue

Morris Weissberg.....1101 Bushwick Ave., Brooklyn

ASSOCIATE FELLOWS ELECTED JANUARY 2, 1930

Walter Gregory Bowerman, A.B.....199 Glenwood Avenue, Leonia, N. J.

Malcolm W. Carr, D.D.S.....667 Madison Avenue

A BEQUEST DECLINED

At a recent meeting of the Council it was reported that under the will of a former Fellow, the Academy was bequeathed a number of shares in an industrial company to create a special named fund, "Whose net income shall be paid every two years to the physician who shall have made the greatest advance in that period in the field of —— —— work and research in the judgment of the Committee of this fund, which the said Academy may appoint. This Committee shall have the power to decide whether essays shall be submitted and make all directions in regard hereto. I make it a condition in connection with this bequest, that my nephew, (a Fellow of the Academy) shall for his life be chairman of said Committee and shall receive in compensation for his services annually 10% of the income of said fund."

The Council and Trustees were unanimous in declining this bequest and for the following reason:

> That the membership of the Committee and the full control does not rest with the governing body of the Academy. The Chairman of the Committee is stipulated in advance and part of the income of the fund is to be paid to the Chairman for life.

This is the fifth specific bequest or gift that has been declined by the Academy during the past four years for similar reasons.

It is suggested again that if Fellows or other friends plan to leave a bequest to the Academy, they should consult with a Trustee or officer of the Academy before reaching a final decision.

DEATHS OF FELLOWS OF THE ACADEMY

CYRIL BARNERT, M.D., 1123 Park Avenue, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1904; elected a Fellow of the Academy, October 4, 1928; died, January 8, 1930. Dr. Barnert was a Fellow of the American College of Surgeons, a member of the County and State Medical Societies, a member of the Society of Associated Alumni of Mt. Sinai Hospital, a member of the Society of Alumni of Lebanon Hospital, Associate Ophthalmic Surgeon to Lebanon and Mt. Sinai Hospitals and Consulting Ophthalmologist to Barnert Memorial and Beth Israel Hospitals, Passaic, New Jersey.

ERNST DANZIGER, M.D., 285 Central Park West, New York City; graduated in medicine from New York University, New York City, in 1894; elected a Fellow of the Academy, February 6, 1908; died, January 7, 1930. Dr. Danziger was a Fellow of the American Medical Association and a member of the County and State Medical Societies. He was Oto-Laryngologist to Sydenham Hospital, Consulting Oto-Laryngologist to Montefiore and Lenox Hill Hospitals, Out Patient Department.

CLARENCE FLOYD HAVILAND, M.D., Manhatan State Hospital, Welfare Island, New York; graduated in medicine from Syracuse University, Syracuse, New York, in 1896; elected a Fellow of the Academy, April 19, 1928; died, January 1, 1930. Dr. Haviland was a Fellow of the American Medical Association. He was also a member of the County and State Medical Societies, a member of the American Psychiatric Society, a member of the American Psychopathic Society, a member of the Psychiatric Society of New York, a member of the Neurological Society of New York, and a member of the Clinical Psychiatric Society. He was Superintendent of the Manhattan State Hospital.

FRANK CANFIELD HOLLISTER, M.D., 264 West 77th Street, New York City; graduated in medicine from the Bellevue Hospital Medical College, New York City, in 1890; elected a Fellow of the Academy May 15, 1902; died, November 30, 1929. Dr. Hollister was a Fellow of the American Medical Association, a member of the County and State Medical Societies, and the Society of Alumni of Bellevue Hospital, Physician to St. Elizabeth's Hospital and Consulting Physician to Good Samaritan Hospital, Suffern, N. Y.

ELLIOTT NORTON, M.D., 405 Park Avenue, New York City; graduated in medicine from the New York Homoeopathic Medical College and Flower Hospital, New York City, in 1916; elected a Fellow of the Academy May 17, 1928; died, August 2, 1929. Dr. Norton was a Fellow of the American Medical Association, a member of the County and State Medical Societies and a member of the Pathological Society. He was Surgeon of Ophthalmology to Fifth Avenue Hospital and Associate Ophthalmologist to Polyclinic Medical School and Hospital.

JOHN EASTMAN WILSON, M.D., 114 East 54 Street, New York City; graduated in medicine from the New York Homoeopathic Medical College and Flower Hospital, New York City, in 1883; elected a Fellow of the Academy October 7, 1920; died, December 19, 1929. Dr. Wilson was a member of the American Institute of Homoeopathy, and the Homoeopathic Medical Society of New York. He was Consulting Neurologist to Fifth Avenue, Broad Street and Middletown State Hospitals, New York; Neurologist to the Homoeopathic and Maternity Hospitals, Yonkers, and Ann May Memorial, Spring Lake.